Mainstreaming Tokenized Finance: How Money Market Funds are Going Digital*

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April 28, 2026

Abstract

We study the role of the rapidly expanding asset class of tokenized money market funds (TMMFs) within the digital finance ecosystem. TMMFs represent blockchain-native claims on conventional money market funds, combining on-chain settlement with off-chain short-term safe assets. We document their institutional structure and market evolution. Exploiting exogenous shocks to crypto-asset prices, we show that markets perceive TMMFs as safer than stablecoins, whose main role in digital finance remains that of a *medium of exchange*. In contrast, TMMFs increasingly perform a *store-of-value* role, acting as a safe haven during periods of market stress.

Keywords: Decentralized Finance, Blockchain, Real World Assets (RWAs), Tokenization, Money Market Funds

JEL Classification Codes: G10, G12, G15, G20, G21, G23, O30

*We received helpful comments and suggestions from Ulf Lewrick. We also thank participants of the Hong Kong Academy of Finance (AoF). This project benefited from the invaluable assistance of Debora Candela (Collegio Carlo Alberto) and Isotta Valpreda (Collegio Carlo Alberto).

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1 Introduction

Tokenization, the creation of digital representations of real-world assets (RWAs) on a blockchain, has reached a critical turning point after years of experimentation. Tokenized assets include real estate, commodities, and private credit that can be traded on blockchains around the clock and pledged as collateral in cryptoasset transactions. We examine one of the fastest-growing asset classes, Tokenized Money Market Funds (TMMFs), which bring traditional money market funds (MMFs) to the blockchain.

We analyze investors' allocations between stablecoins, the closest blockchain equivalent to cash, and TMMFs. Following negative shocks to the crypto-market, we find that, in aggregate, stablecoin holdings decline sharply, while the impact on TMMF is negative but moderate. However, this decline could also be attributed to the extensive margin - investors entering at a slower pace in the growing TMMFs market. We then collect detailed wallet-level transaction data for all wallets that ever held a TMMF. At the wallet level, we document that TMMF holdings increase, rather than decrease, after a crypto shock, while stablecoin holdings decrease. This behavior is consistent with a rebalancing effect away from stablecoins and towards TMMFs, and with a limited total impact on total crypto-asset wallet-level holdings. Our findings are more pronounced for wallets with average holdings exceeding 10,000 USD.

Our findings are consistent with markets perceiving TMMFs as safer than stablecoins. Stablecoins are primarily rooted in the blockchain, while TMMFs are rooted in the traditional financial system and just have an on-chain representation. While stablecoins are

backed by similar financial assets as MMFs, they cannot rely on the implicit safety net that has been provided to MMFs in the past, such as the Temporary Guarantee Program from the US Treasury in 2008. Stablecoins also have redemption risk; typically, only a handful of primary dealers are allowed to redeem stablecoins with the issuer for cash. Other stablecoin holders have to sell in the secondary market for an uncertain price.

Our analysis can also shed some light on the use of money. Stablecoins can be held by anyone and are widely used in on-chain Decentralized Finance (DeFi) markets and on centralized exchanges (CEXs). Their widespread adoption across thousands of DeFi protocols makes them an ideal vehicle for trading and arbitrage. Since they do not pay interest, they are not suitable for long-term investment. Stablecoins, therefore, represent more the classic *medium of exchange* function of money. TMMFs, on the other hand, are often restricted to whitelisted wallets, limiting their use for trading and as collateral. They offer fair interest rates and are safe, with a foundation in traditional financial markets and implicit government assurances. TMMFs, therefore, are linked to the *Store of Value* function of Money. Small but positive transaction costs make on-the-fly conversion between stablecoins and TMMFs often infeasible. Our results are consistent with trading opportunities declining during downturn, decreasing utility of stablecoins as a medium of exchange, and an increase in the value of storage.

TMMFs experienced a meteoric rise in the last 18 months. The total value locked (TVL) in TMMFs increased from USD 800 million at the end of 2023 to more than USD 9 billion in November 2025, with most of this volume on Ethereum. TMMFs are projected to become the fastest-growing digital asset class, unlocking the potential to digitalize the

MMF market. As a potential source of a safe asset, TMMFs could facilitate significant growth in digital finance.

Conventional MMFs represent a prominent asset class, investing in highly liquid and secure instruments such as short-term U.S. Treasury bills and commercial paper, which are widely used for cash management. United States-based traditional MMFs manage over USD 6.1 trillion in assets, with an additional USD 1.2 trillion held by non-U.S.-based MMFs. MMFs are almost cash-like, and often maintain a stable net asset value (NAV) per share, generally targeted at $1.00 in the United States, despite the changes in the market value of the underlying asset. A successful tokenization at scale of MMFs for both retail and institutional investors may result in direct competition with stablecoins (and, indeed, with any future issuance of CBDCs). Stablecoins are commercial cryptoassets that purport to offer tokenholders stable value by investing in highly liquid instruments and maintaining a fixed exchange rate of one dollar per token. The annual stablecoin transfer volume reached $27.6 trillion in 2024, surpassing the combined volumes of Visa and Mastercard, according to a January 31st report by crypto exchange CEX.io. The Genius Act, recently passed in the U.S., mandates stablecoins to invest in short-term U.S. Treasuries, but forbids interest payments to coinholders. Instead, TMMFs pass on the yield they earn from their investments to their tokenholders, allowing investors to access money-market returns and, at the same time, benefit from the features of a blockchain cryptoasset.[1]

[1] At present, TMMFs are almost exclusively targeted at institutional investors, rather than at the retail investors that characterize the stablecoin environment. By imposing restrictions on their tokens, only a limited number of participants can trade them on-chain. Currently, TMMFs are not used for payments; however, they are increasingly used as collateral on crypto trading platforms focused on options, allowing

We explain the functioning of the largest TMMFs, discussing their individual features, including compatibility with other protocols. While most TMMFs work similarly, there are differences in the investment universe, fee structure, and minimum investment amount.

We examine selected TMMFs in detail, focusing on portfolio composition, counterparties, and asset allocation to understand how they operate beneath the surface. Blackrock's BUIDL accounts for nearly half of the combined AUM and holds a diversified mix of time deposits, Treasury and government repurchase agreements, and other short-term instruments across numerous counterparties. OUSG, Ondo's short-term U.S. Treasuries product, is anchored by BUIDL but also holds WTGXX, FYOXX (the underlying fund of FDIT), FYHXX, SHV, cash, and USDC. These case studies illustrate the asset structures, diversification, and operational features of leading TMMFs.

2 Literature Review

The literature on TMMFs is currently in its infancy, and this paper is, to the best of our knowledge, the first to analyze the market in depth. Some short pieces focusing on specific aspects of TMMFs have been published mostly by public authorities. Aquilina et al. (2025) discuss the growth of TMMFs and describe their business model, Barbaroux et al. (2025) and Vardoulakis et al. (2025) focus on the risks that TMMFs may pose to the stability of the system, while Azar et al. (2025) describe some of the use cases of tokenized investment funds, with a focus on TMMFs. Given the nature of TMMFs, however, there

institutional investors from the traditional financial sector to participate in native crypto activities.

are two strands of literature relevant to contextualizing our research. The first focuses on conventional MMFs, while the second is a more recent analysis of stablecoins, a product that shares similarities with TMMFs.

Kacperczyk and Schnabl (2013) highlight how MMFs were born in the United States in the 1970s as a response to Regulation Q, which prohibited banks from paying interest on checking accounts and capped the amount of interest on savings accounts. By buying shares in MMFs, investors could access money-market yields that were significantly higher than those available in bank accounts, thereby contributing to the industry's growth. While Regulation Q has since been repealed, and MMFs have changed since their inception, they remain an important component of the financial sector in many jurisdictions around the globe. Recent reports by Financial Stability Board (2021, 2024) describe many of the characteristics of modern MMFs and highlight how they are used by investors and issuers. From an investor's perspective, MMFs have several advantages: they provide principal stability (or extremely low volatility) and offer daily liquidity, so that investors – and, in many cases, public authorities – consider them a very close substitute for cash. Furthermore, they provide money-market yields to investors who could not easily access them on their own (e.g., retail investors). In addition, by holding instruments issued by multiple counterparties, they can diversify their exposure.

MMFs are also an important source of funding for different institutions. At present, instruments issued by governments or government-backed entities account for the lion's share of what MMFs invest in (approximately 80% of global assets). However, highly rated financial and non-financial corporates often tap money markets to fund their ongoing

expenses, and rely on MMFs to buy them.

In the United States and Europe, the two most important jurisdictions by size, MMFs can be divided into two broad subsets: MMFs that invest exclusively in public debt (*government*) and those that don't (*prime*). Government funds can invest only in securities issued by the government (including the US Treasury and federal agencies in the US case) and in repos collateralized by such securities. In contrast to other types of mutual funds, these funds maintain a stable NAV, i.e., the value of each share is pegged to one US dollar (or one Euro).

Prime MMFs also invest in short-term commercial paper and certificates of deposit issued by financial and non-financial corporates (Aquilina et al., 2023). They do not have a stable NAV and therefore a single share is not always valued at one dollar, but their price volatility is typically very small: the value of a share rarely deviates from one dollar by more than a few basis points, except for severe stress periods where MMFs did *break the buck*.

TMMFs currently in existence are all in the former category, i.e., they are *government* funds and exclusively invest in US government securities. As such, they represent the safest form of funds. In the future, however, there are no impediments to TMMFs starting to invest in assets other than government securities, thereby creating *prime* TMMFs.

A substantial amount of literature highlights that the combination of offering daily liquidity to investors and investing in assets that are not easy to sell quickly makes MMFs subject to runs. Kacperczyk and Schnabl (2013) and Schmidt et al. (2016) document that, at the peak of the 2008 financial crisis, MMFs had substantially increased their

risk-taking, and investors withdrew money, especially from the riskier funds. They argue that MMFs are inherently fragile because they have an incentive to increase risk-taking in good times, leaving them vulnerable in bad times. A first wave of regulation introduced after the 2008 financial crisis did not successfully solve this problem: during the market turmoil at the onset of the COVID-19 pandemic in 2020, MMFs were once again subject to runs. These runs had different characteristics depending on the type of investors (Cipriani and LaSpada, 2024) and on the specific characteristics of the fund (Li et al., 2021). *Prime* funds have historically been those subject to runs, while *government* funds have not experienced similar episodes.

Moving on to the second strand of the literature, the analysis of stablecoins ballooned in the last few years, as their market capitalization rose from just a few billion US dollars in early 2020 to more than 300 billion in late 2025. Different authors focused on different aspects of stablecoins and compared them with private banknotes that circulated during the free banking era in the US (Gorton and Zhang, 2023), exchange-traded funds (Ma et al., 2023), eurodollars (Aldasoro et al., 2023), and, of course, MMFs (Anadu et al., 2024).

Stablecoins come in three guises: fiat-backed stablecoins support their value by investing in short-term dollar assets, such as US government or corporate securities. Crypto-backed stablecoins invest in digital assets (such as Bitcoin and Ethereum). They are typically overcollateralized, meaning that the value of the assets they invest in exceeds the value of the stablecoin itself, to account for the fact that crypto assets are often very volatile and could decline below the stablecoin's value. The third type of stablecoin

supports its value through an algorithm that adjusts the quantity of another crypto asset when the stablecoin's value moves away from par, enticing arbitrageurs to sell the overpriced asset and buy the underpriced one, thereby re-establishing the peg. Fiat-based stablecoins have now come to dominate the market, representing approximately 90% of the total amount of stablecoins in circulation. As the algorithmic version has essentially disappeared since the collapse of Terra in 2022, the rest is made up of crypto-backed stablecoins. Fiat-backed stablecoins also share many of their characteristics with TMMFs. Indeed, TMMFs also support their value by investing in short-term assets. The biggest difference between fiat-based stablecoins and TMMFs is that while TMMF holders receive the interest that such assets pay, stablecoin holders typically do not, as the proceeds are typically kept by the issuer. In the US, the GENIUS Act, approved in 2025, explicitly forbids stablecoin issuers from paying interest to holders. In Europe, similar provisions are contained in the Markets in Crypto-Assets Regulation (MiCA).

In terms of overall amounts, stablecoins are currently almost an exclusively US dollar phenomenon. While stablecoins tracking other currencies exist[2], in October 2025, more than 97% of the value of stablecoins was for those that tracked the US dollar.

As a result of this dominance, which was even more pronounced when stablecoins were in their infancy, and of the fact that the interest paid by short-term US government securities was very close to zero, the early literature on stablecoins focused on assessing the quality of their reserves. Anadu et al. (2024) drew a specific comparison with MMFs and documented a large variation in the quality of the assets in which stablecoins are

[2]Stablecoins exist that are pegged to the Euro, the Japanese Yen, the British Pound, and the offshore version of the Chinese Yuan. Projects for a Swiss Franc and Korean Won stablecoin are also ongoing.

invested. While some invested almost exclusively in cash, bank deposits, and risk-free assets, others had a much riskier portfolio, which included loans and potentially dollar-denominated instruments issued by corporations non-domiciled in the US. They show that, within stablecoins, flows move from riskier to safer ones during periods of stress in crypto markets. A similar phenomenon is observed in MMFs where flows typically move from *prime* MMFs to government ones in the presence of turbulence.

As interest rates rose following the significant increases in prices that followed the COVID pandemic, stablecoins moved away from investing in riskier assets and focused on instruments issued by the US government: by 2024, the amount of T-Bills bought by stablecoins was in the same ballpark as the largest traditional MMFs and exceeded those bought by many foreign investors (Aldasoro et al., 2025). US-regulated stablecoins will therefore not be able to invest in riskier assets, even if interest rates decline from current levels. The same cannot be said of TMMFs: their issuers will have a strong incentive to compete on yield and invest in riskier assets in a low-interest-rate environment.

The change in their overall riskiness notwithstanding, there is no evidence that stablecoins as a whole are perceived as a *safe haven* within the crypto ecosystem. Aldasoro et al. (2024) show that in periods of crypto market stress, stablecoins do not experience inflows. Not only that, but stablecoin inflows are negatively affected by increases in interest rates. On the one hand, this is not surprising, given that such an increase would raise the opportunity cost of holding a stablecoin (since there are no interest payments). But it shows that dynamics within crypto and stablecoins are inherently connected to developments in finance more generally.

More recent literature has expanded the analysis of stablecoin vulnerabilities and also identified their effects on and connections with traditional financial markets. Bertsch (2023) highlights that issuers are vulnerable to runs triggered not only by information about the quality of their reserves, but also by custodial, operational, and technological risks. Along similar lines, Ahmed et al. (2024) and Ma et al. (2023) develop theoretical models linking the run risk to the price volatility of stablecoins and of their underlying assets.

Moving on to the effects of stablecoins on traditional markets, Barthelemy et al. (2023) were the first to document that issuers of commercial paper accommodated the additional demand generated by stablecoins by issuing more, thereby linking short-term funding markets to developments in crypto. Similar effects are also present in Treasury markets. Ahmed and Aldasoro (2025) find that a 2-standard deviation inflow into stablecoins lowers 3-month Treasury yields by 2-2.5 basis points within 10 days. The effect is asymmetric: outflows raise yields by two to three times as much as inflows lower them.

Gorton et al. (2025) provide evidence that stablecoins are desirable despite not providing yield as they are used as collateral for crypto transactions, taking on the role of a gateway to high-yield short-term investments which would be otherwise unavailable.

3 The functioning of Tokenized Money Market Funds

TMMFs are rapidly emerging as a potential competitor to stablecoins. They provide yield-bearing collateral that can be used in digital financial markets and can expand the

universe of potential investors in MMFs.

As they are claims on traditional money market instruments, they can offer returns close to short-term risk-free rates—a clear advantage over stablecoins while still allowing investors to interact with the crypto ecosystem. As tokens, they can be embedded in smart contracts and leveraged to exploit their programmability.

Their access to distributed ledgers and peer-to-peer trading has significant potential advantages. For one, investors could, in principle, continuously rebalance their positions without the need for intermediaries, while earning returns for the time they hold their TMMF shares. Furthermore, peer-to-peer trading of TMMFs could promote their use to meet margin calls, reducing the need for investors to redeem shares to access liquidity. As on-chain derivatives markets grow and more traditional assets become tokenized, this feature could become particularly useful (Aquilina et al., 2025). Finally, TMMFs are enabling fund management companies to broaden their investor base beyond existing distribution channels, targeting crypto companies and retail investors that seek money market returns while remaining on-chain.

All TMMFs are regulated in some way, but not all of them have a conventional MMF as their underlying, and the legal structures chosen by the various issuers differ. For instance, Franklin Templeton's BENJI token is a digital representation of a US-regulated MMF and therefore subject to all the restrictions of US MMFs, including limits on liquidity and maturity transformation. On the other hand, Blacrock's BUIDL, the largest TMMF at the time of writing, is a private fund only available to accredited investors. As a result, its shares can only be sold to qualified purchasers. The advantage of this structure is that

it offers greater flexibility in the types of assets the fund can hold, as well as potential tax advantages. However, the cost is a reduced potential pool of investors.

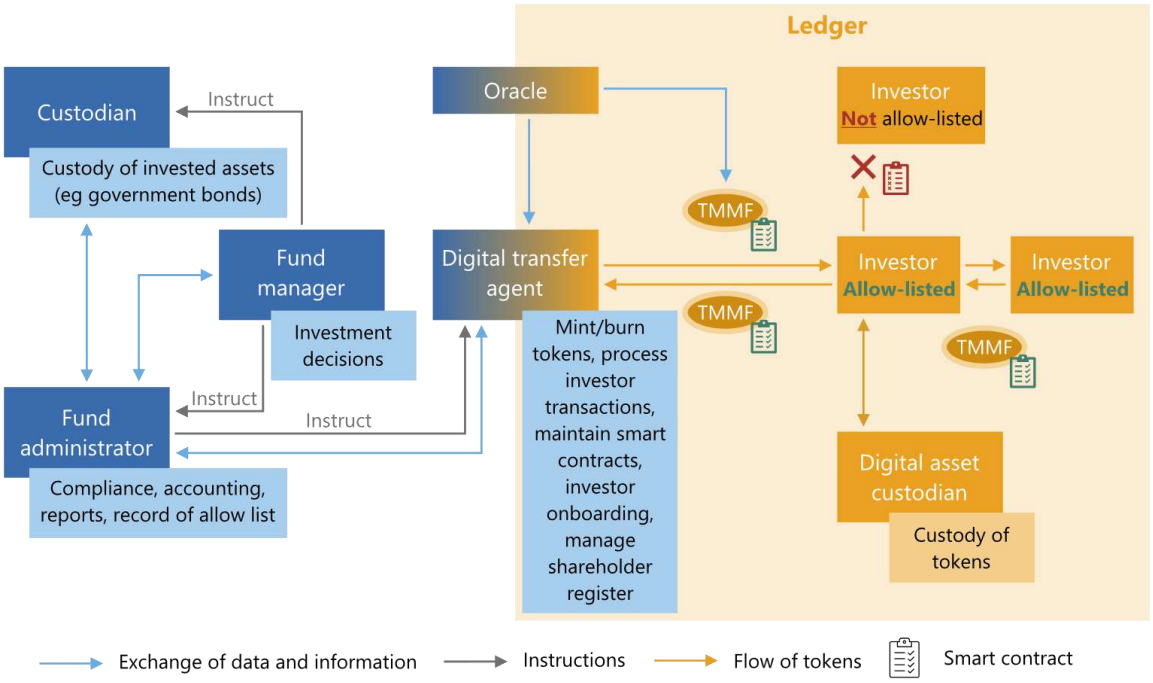


Figure 3.1: The operational model of TMMFs.

While the specific rules are different depending on the structure chosen by each fund, compliance requirements require that TMMF restrict the investors that can directly hold their shares.[3] Investors need to be onboarded by the fund administrator, or by an external platform that manages the transactions on the fund's behalf. In practice, an 'allow-list' of wallets that comply with anti-money laundering legislation and meet any additional requirements of a fund needs to be created to let investors trade TMMF tokens. Additional requirements could include whether investors meet the qualified purchaser threshold or can commit to investing the minimum amount required by the fund. The fund admin-

[3]This is different from stablecoins and other types of cryptoassets, which circulate freely on the blockchain with little or no oversight on the identity of investors.

istrator regularly updates the list, which is accessible via an oracle on the blockchain.[4] Minimum investment amounts vary depending on the targeted investor base: in some cases, funds focus specifically on institutional investors and have minimum amounts of 5 million USD, funds that focus on retail investors have much lower minima, in some cases as low as a single US dollar. Like share classes in conventional MMFs, some funds have different minimums depending on the blockchain on which they trade. Stellar, a blockchain with substantially lower fees, is home to many funds with very low minimum investment amounts.

Details differ across issuers; however, TMMFs generally follow a similar operational model, as shown in Figure 3.1. Subscriptions begin when investors send USD or USDC to the transfer agent's bank account. The transfer agent links the on- and off-chain parts of the TMMFs. Once the transaction settles, tokens representing fund shares are minted to the investor's wallet, which is often managed by a digital asset custodian, while the TMMF issuer buys the underlying assets, which are typically held by a conventional custodian. The transfer agent monitors the total supply of tokens, and token prices are typically updated to an oracle once per business day. For redemptions, the opposite process occurs. Investors initiate a burn of their tokens, reducing the total supply; the issuer liquidates the corresponding assets and sends USD or USDC back to the transfer agent's account for disbursement to the investor. The return accrued to investors is paid at regular intervals, typically daily or monthly. This can take the form of additional tokens for TMMFs that aim to maintain a stable net asset value (NAV) per share, or

[4] An oracle is an entity that is trusted to collect, record, and disseminate real-world data from various sources to a blockchain. This enables smart contracts to refer to them when effecting transactions.

of accumulation within the fund, thereby raising the NAV. In addition to subscribing or redeeming, a subset of investors vetted by the TMMF issuer can trade tokens on-chain among themselves. If an investor is not on the allow list, any attempt to transfer TMMF tokens to its wallet will fail.

Overall, TMMFs currently operate in a hybrid market, as their underlying assets are still traded in conventional financial markets and a range of TMMF-related activities are still performed off-chain. These activities include fund management, compliance, and custody of the underlying assets. The need to operate in this hybrid way is a direct consequence of the fact that TMMFs are on-chain representations of regulated funds and therefore need to fulfill requirements that – at least for now – cannot be fulfilled on-chain.

4 Data and Methodology

4.1 TMMFs and Stablecoins

For TMMFs, we obtain fund-level metadata as well as time-series data on TVLs and token prices from rwa.xyz, a leading data provider and analytics platform specializing in real-world asset (RWA) tokenization. In our analysis, we rely on the largest TMMFs at the time of writing; the names and Ethereum addresses are listed in Table A.1. We also rely on the same data source for information on the aggregate USD TVL of stablecoins.

4.2 Wallet Data

To identify and analyze wallet-level interactions with TMMF and stablecoins on the Ethereum blockchain, we first collect all TMMF token transfers on the Ethereum Blockchain. Each transfer records the sender and receiver wallet (from and to fields) on the blockchain, which gives us all the wallets that ever held a TMMF. For this set of wallets, we collect all transactions they ever initiated on Ethereum to understand their activity.

To find wallet holdings, we query the node for the end-of-day balances that these wallets held in TMMFs and Stablecoins.[5] We then compute the token value (i.e., the number of tokens multiplied by the token price) held by each wallet in TMMFs and stablecoins at the end of each day.

The sample includes all 2,902 wallets ever holding TMMFs between the first observation of a TMMF on December 21, 2022 and March 31, 2026. We average the daily holdings at the end of day UTC at the weekly level.[6] Since the TMMF market grew very rapidly to sizable consistencies only in the last 18 months, we conduct most of our analysis on 2024 and 2025 wallet balances. For each of these wallets, we also measure the total amount of stablecoin holdings. All balances are measured by multiplying token amounts by their respective daily valuations.

[5]Inferring the balances from transfers in and transfers out can be inaccurate since some tokens, so-called re-basing tokens, adjust token balances without triggering a blockchain event. This re-basing mechanism is often used to pay daily interest.

[6]Out of the total number of wallets, 783 hold zero balances throughout the sample, presumably only operating at the intra-day frequency. These wallets are excluded from the analysis. These wallets could include deposit wallets for centralized exchanges that accept deposits and, after passing consistency checks, deposit the funds into the exchange's hot wallet.

4.3 MMF Data

We combine data on U.S. MMFs, government bond yields, and financial market indicators.

Data on aggregate assets under management (AUM) and yields of U.S. money market mutual funds are obtained from iMoneyNet. The dataset contains: Aggregate assets under management for U.S. MMFs, expressed in trillion U.S. dollars; yield (1, 7, 30 day): Annualized net yields computed from the realized return over the specified horizon (1, 7, or 30 days). Yields are net of fees and are annualized under the assumption that income earned on the principal is not reinvested. MMFs are classified into government and prime funds. Government MMFs are constructed as the sum of Treasury and Treasury repo funds, while prime MMFs are constructed as the sum of first-tier and second-tier prime funds. Tax-exempt funds are excluded, as they primarily invest in municipal bonds.

We use daily government bond yields at different maturities for the United States, Germany, France, and the United Kingdom.

4.4 Financial Market Data

To control for broader financial market conditions, we include the following variables:

S&P 500 Index (SPX): A measure of U.S. equity market performance, Brent crude oil price (BRT): The spot price of Brent crude oil. VIX Index: A measure of implied volatility in U.S. equity markets. U.S. Dollar Index (DXY): A measure of the external value of the U.S. dollar.

We extract token prices for major currencies (Bitcoin, Ethereum) from the Crypto-

Compare API in hourly frequency.

4.5 Gas Fees

We calculate the USD gas fee for each transaction by combining on-chain data with historical Ethereum (ETH) prices. For each transaction hash sourced from rwa.xyz, we query the Ethereum blockchain to obtain the gas consumed (gasUsed) and the gas price paid in Wei (effectiveGasPrice). We convert this cost to ETH, then multiply it by the daily ETH/USD closing price on the transaction date to determine the final cost in USD.

5 Overview of TMMFs and Interactions within DeFi

The empirical analysis starts with an overview of the major TMMFs, followed by a discussion of their use in other DeFi protocols.

5.1 TMMFs

TMMFs experienced a meteoric rise starting from 2024. Figure 5.1 plots the TMMF TVL over time. Aggregate TMMF holdings were below USD 800 million at the end of 2023 and rose to almost USD 7.5 billion by the end of June 2025, with most of this volume on Ethereum.

Table 5.1 lists the funds in our sample, including tickers, fund names, and issuing entities, while Table 5.2 summarizes the composition of their underlying assets, which are primarily short-term U.S. Treasury securities and liquidity funds.

Table 5.3 summarizes key metrics for the TMMFs, including TVL, token holders, and

(a) Aggregate TMMFs TVL

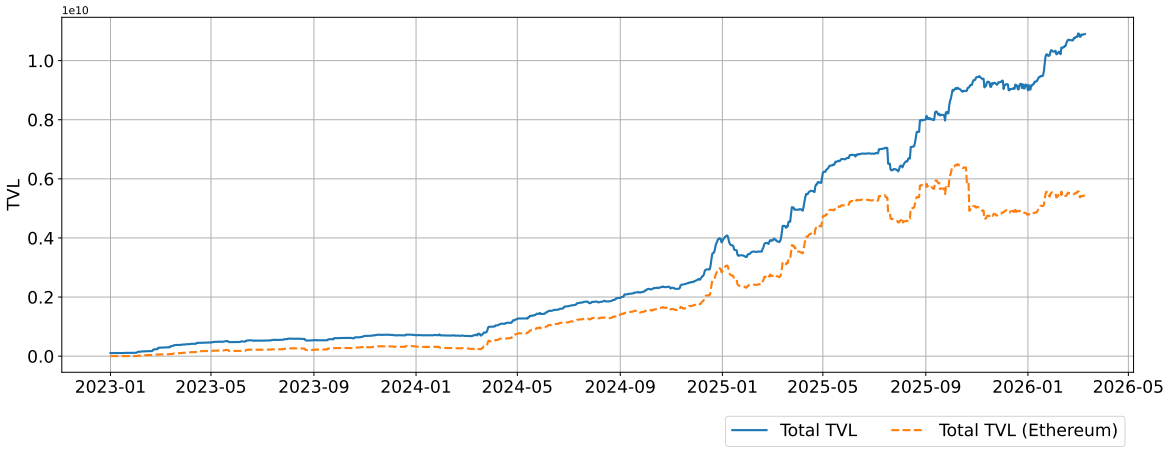


Figure 5.1: Aggregate TMMFs TVL. The Figure shows the aggregate TVL of all TMMFs (solid blue line) over time on all blockchains and on the Ethereum blockchain (dashed orange line). The data is sourced from rwa.xyz.

inception dates. There are significant differences in fund size and investor distribution across the TMMFs. BlackRock's BUIDL is the dominant fund with a substantial TVL of approximately 1.98 billion USD, hold by a concentrated group of 66 token holders. Conversely, USDY demonstrates the widest investor base with 412 token holders, supporting a TVL of 438.9 million USD. In terms of transaction activity, newer funds like FDIT and ULTRA have a limited number of holders and lower TVL, reflecting their 2025 launches. Meanwhile, established funds like OUSG and WTGXX, which launched in early 2023, have accrued significant TVL of 625.3 million and 820.2 million USD, respectively. These metrics collectively illustrate a diverse and maturing market, with varying strategies between large, institutional-focused funds and those with broader, more retail-oriented investor participation.

TMMFs exhibit substantial heterogeneity in fee structures, investment accessibility, and on-chain activity. Management fees and minimum investment requirements vary

Ticker	Name	Issuer
BUIDL	BlackRock USD Institutional Digital Liquidity Fund Ltd.	BlackRock, Inc.
FDIT	Fidelity Digital Interest Token	Fidelity
JTRSY	Janus Henderson Anemoy Treasury Fund	Anemoy
OUSG	Ondo Short-Term US Government Bond Funds	Ondo Finance
TBILL	OpenEden TBill Vault	Hill Lights International Ltd.
ULTRA	Delta Wellington Ultra Short Treasury On-Chain Fund	Delta Wellington
USDY	Ondo U.S. Dollar Yield	Ondo Finance
USTB	Superstate Short Duration US Government Securities Funds	Superstate Asset Trust
USTBL	Spiko US T-Bills MMF (FR001400ODM9)	Spiko
USYC	Hashnote's Short Duration Yield Fund (SDYF)	Hashnote Management LLC
WTGXX	WisdomTree Government Money Market Digital Fund	WisdomTree

Table 5.1: Overview of TMMFs – Ticker, Name, and Issuer. This table presents a detailed summary of the TMMFs, including their tickers, fund names, and the corresponding issuing entities. The respective token addresses are listed in Table A.1.

widely across funds, reflecting differences in target investor bases. BUIDL charges the highest management fee (50 bps) and imposes a USD 5 million minimum investment, consistent with a strongly institutional orientation, whereas most other funds charge lower fees of 15–25 bps and have more moderate entry thresholds. In contrast, TBILL and ULTRA do not charge management fees but levy redemption fees, with ULTRA's fee particularly high, whereas USDY and USYC impose no fees. Minimum investment requirements range from zero for retail-oriented funds to USD 5 million for BUIDL, underscoring large differences in investor accessibility (Table A.2). These institutional distinctions are mirrored in on-chain behavior: institutional-focused funds such as BUIDL exhibit relatively infrequent but large mint and burn transactions, while other funds—most notably USYC—display high transaction volumes with substantially smaller average transaction sizes, consistent with more frequent, lower-value usage. Several funds, including FDIT and BENJI, show very limited on-chain activity. Transaction costs also vary considerably across funds and transaction types, with some burn and transfer operations associated

Ticker	Underlying
BUIDL	BlackRock ICS US Dollar Liquidity Fund
FDIT	Short-Term US Treasuries
JTRSY	Short-Term US Treasuries
OUSG	BUIDL, FOBXX, WTGXX, ULTRA, FYHXX
TBILL	Short-Term US Treasuries
ULTRA	Short-Term US Treasuries
USDY	Short-Term US Treasuries
USTB	Short-Term US Treasuries
USTBL	Short-Term US Treasuries
USYC	Short-Term US Treasuries
WTGXX	Short-Term US Treasuries

Table 5.2: Overview of TMMFs – Ticker, and Underlying. This table presents a detailed summary of the TMMFs, including their tickers and underlying.

	TVL	Token Holder	Inception
BUIDL	1,982,230,617.89	66	2024-03-20
FDIT	203,685,559.96	2	2025-08-04
JTRSY	337,484,406.09	6	2024-08-05
OUSG	625,306,409.94	63	2023-01-26
TBILL	175,865,643.22	45	2023-03-24
ULTRA	79,396,882.21	6	2025-02-19
USDY	438,873,806.42	412	2023-07-10
USTB	292,027,375.60	66	2024-01-03
USTBL	43,156,155.26	17	2024-05-15
USYC	172,518,220.54	44	2023-05-01
WTGXX	820,174,508.33	16	2023-01-19

Table 5.3: Summary Statistics of TMMFs. This table provides a snapshot of each TMMF's Total Value Locked (TVL), number of token holders, and inception date as of September 16, 2025. The data is sourced from rwa.xyz.

with comparatively high gas fees. Overall, the evidence points to pronounced heterogeneity in both the economic design and operational intensity of TMMFs (Table A.3). Our findings also show that TMMFs are less versatile than stablecoins. Due to KYC requirements or restrictions on accredited investors, TMMFs are not accessible to the same pool of users as stablecoins, resulting in substantially fewer token holders. Minimum investment amounts listed in Table A.2 further limit the TMMF user base. Switching between TMMFs and stablecoins is not free either. Table A.2 shows that two TMMFs in our sample charge redemption fees, and Table A.3 summarizes gas fees that users pay when switching into and out of TMMFs.

5.2 Interaction of TMMFs with the DeFi Ecosystem

The integration of TMMFs into the broader digital asset ecosystem is accelerating, creating novel use cases and deepening their utility beyond simple yield generation. Building on the examples provided:

For example, Ethena Labs' synthetic stablecoin (USтb) uses BUIDL as a core component of its collateralization strategy, leveraging its deep liquidity and stability to back its yield-bearing synthetic dollar. Additionally, BUIDL has become eligible as collateral for stablecoins issued on the M0 platform, enabling issuers to back their tokens with tokenized U.S. Treasury securities. M0 serves as shared on-chain infrastructure for stablecoin issuance, standardizing collateral management, governance, and settlement, rather than requiring each issuer to develop these systems independently. Similarly, rUSDY (the wrapped, transferable version of Ondo Finance's USDY) is being integrated into liquidity

pools on decentralized exchanges, such as a rUSDY/USDC pair on Curve Finance, enhancing its composability and accessibility in DeFi. In traditional crypto finance, major institutions are increasingly recognizing the value of tokenized assets. Deribit, a leading crypto options exchange, now accepts BUIDL as ("real-time") collateral for options trading accounts, providing traders with a capital-efficient way to earn yield on their margin collateral while maintaining market exposure.

Furthermore, the utility of these instruments extends into decentralized lending protocols. Aave Labs has launched a new institutional platform, Horizon, that allows qualified investors to borrow major stablecoins using TMMFs as collateral. This initiative aims to bridge the growing TMMF market with DeFi lending by providing short-term financing options, thereby turning otherwise static TMMFs into usable capital. Built on the Aave V3 protocol and using Chainlink for real-time pricing, Horizon combines institutional-grade compliance with the efficiency of DeFi, backed by major asset issuers such as VanEck and WisdomTree, as it seeks to tap into a market projected to reach trillions of dollars. When a qualified investor deposits a TMMF as collateral on Horizon, the protocol mints a corresponding, non-transferable "aToken" that represents their deposit. This aToken accrues interest in real time and can be redeemed for the underlying asset, while the issuer maintains control over the permissions and requirements for token access. Lending on Aave for TMMFs mimics security-backed lending, where institutions can access liquidity without selling their holdings. Furthermore, by building on the flexible Aave V3 protocol, Horizon lays the groundwork for future advanced applications, including the potential for "looping" (the repeated use of borrowed assets as new collateral to increase

borrowing power and amplify positions).

BlackRock has made a strategic move into decentralized finance by acquiring an undisclosed position in Uniswap's governance token (UNI) and integrating its tokenized U.S. Treasury fund, BUIDL (approximately $2.2B in assets), with Uniswap's decentralized exchange infrastructure. This integration will enable eligible, pre-qualified investors to trade BUIDL shares on-chain using stablecoins, thereby providing continuous (24/7) secondary-market liquidity. By choosing Uniswap over proprietary or permissioned systems, BlackRock signals growing confidence in decentralized exchanges as viable financial market infrastructure and a potential shift toward broader institutional adoption of public DeFi infrastructure.

This rapid integration across derivatives, lending, and trading venues signals a maturation of the market, in which TMMFs are no longer seen as isolated products but as fundamental, interoperable building blocks within the broader digital financial infrastructure.

6 TMMFs as a safe asset in digital finance

A vast literature (Cipriani and LaSpada (2024); Duygan-Bump et al. (2013); Li et al. (2021)) examined the flight-to-safety behavior of investors towards different asset classes at times of stress in capital markets, including runs experienced by MMFs during the 2008 financial crisis and 2020 COVID crisis.

We investigate empirically the consequences of stress in the cryptoasset market on

TMMFs. Our focus is on the impact of TMMFs' rapid market growth on stablecoins, currently the largest cryptoasset market. We are interested in whether individual investors holding balances in both TMMFs and stablecoins rebalance their portfolios when they include both. We aim to provide an accurate assessment of the use case for the two alternative assets from the investor's perspective, rather than relying on aggregate data that mixes the rebalancing behavior of individual investors with overall investors' entry/exit from the cryptoasset market.

Investors seeking cryptoasset exposure may wish to hold stablecoins even if yield-earning TMMFs are available, for several reasons. First, several stablecoins have established themselves as means of payment, especially in USD, and thus offer a 'convenience yield'. Second, Gorton et al. (2025) provide evidence that stablecoins are desirable despite not providing yield as they are used as collateral for crypto transactions, taking on the role of a gateway to high-yield short-term investments which would be otherwise unavailable. Third, many TMMFs are not easily available to retail customers.

Our approach to assessing the use case of TMMFs relative to stablecoins is to estimate the impact of identified exogenous shocks in cryptoasset markets on the individual portfolio (wallet) holdings of TMMFs and stablecoins. Do TMMFs experience inflows or outflows at times of stress in cryptoasset markets? Do these flows behave differently from those observed for stablecoin holdings by the same individual investor?

6.1 Empirical Methodology

We employ local projections (LP) to estimate impulse response functions of yields and volumes for specific asset classes. We estimate the cumulated impulse response (IR) of the dependent variable from time t to time $t+h$ by running a separate OLS regression for each horizon h. The OLS coefficients β_h trace out the path of holdings or returns for each asset after a one-unit increase at time t to an identified shock.[7]

To assess flight-to-safety behavior, we measure the IR to the identified shock series S_t computed by Aldasoro et al. (2024) and updated by the authors up to October 2025. In their paper, which uses aggregate data to estimate the impact of cryptoasset shocks on stablecoins, "crypto shocks" are built as the unforecastable component of the Bloomberg Galaxy Crypto Index (BGCI) – an index that captures broad crypto-market valuation developments, including the price of major cryptoassets such as Bitcoin and Ethereum. Crypto shocks are measured as the orthogonal component of BGCI returns to contemporaneous and lagged financial and cryptoassets prices.

6.2 Aggregate behavior in response to shocks

In our first estimation, we use aggregate data to establish benchmarks for the behavior of alternative financial asset market capitalizations and yields in response to crypto shocks, and to measure the responses of the aggregate balances of TMMFs and stablecoins held in investors' wallets in our sample.

[7]For a description of the local projection methodology see Jordà (2005), Jordà and Taylor (2024), Inoue et al. (2025).

The estimation equation is given by:

$$y_{t+h} = \alpha_h + \beta_h^1 S_t + \sum_{j=1}^{J} X_{t-j}\Gamma_{j,h} + \sum_{j=1}^{J} Z_{t-j}\Pi_{j,h} + \varepsilon_{t+h} \tag{6.1}$$

where y_{t+h} is the observation for the dependent variable at the h horizon, S_t is the identified crypto shock, X_t is a vector of controls, Z_t is a vector of lagged endogenous variables. Lags from $t-1$ to $t-j$ of the vectors X_t and Z_t are included, with $J = 12$. Among the controls we include the S&P 500 index, the annualized 3-month T-bill yield, the US prime MMF aggregate volume and its average annualized yield, the Bitcoin price, and the aggregate volume of USD-denominated stablecoins. Variables on the right-hand side of the estimation equation are logged (except for yields) and expressed in first-differences. The left-hand side variables are written in long-differences for each horizon h, to minimize bias in the estimation (see Montiel Olea and Plagborg-Møller (2021)). For a logged variable x_t, the long difference is defined as:

$$y_{t+h} = \Delta_h x_{t+h} = x_{t+h} - x_{t-1}.$$

The estimate β_h can be interpreted as the cumulative IR at horizon h for the dependent variable y_t to a one-unit shock S_t occurring at time t. The size of the shock S_t is rescaled to generate a 10 percent fall in the Bitcoin price at the horizon $h = 0$ as in Aldasoro et al. (2024).

Figure 6.1 shows the IRs for the aggregate TMMF and stablecoin holdings computed as total cross-wallet amounts at each t, as well as for the other financial variables included

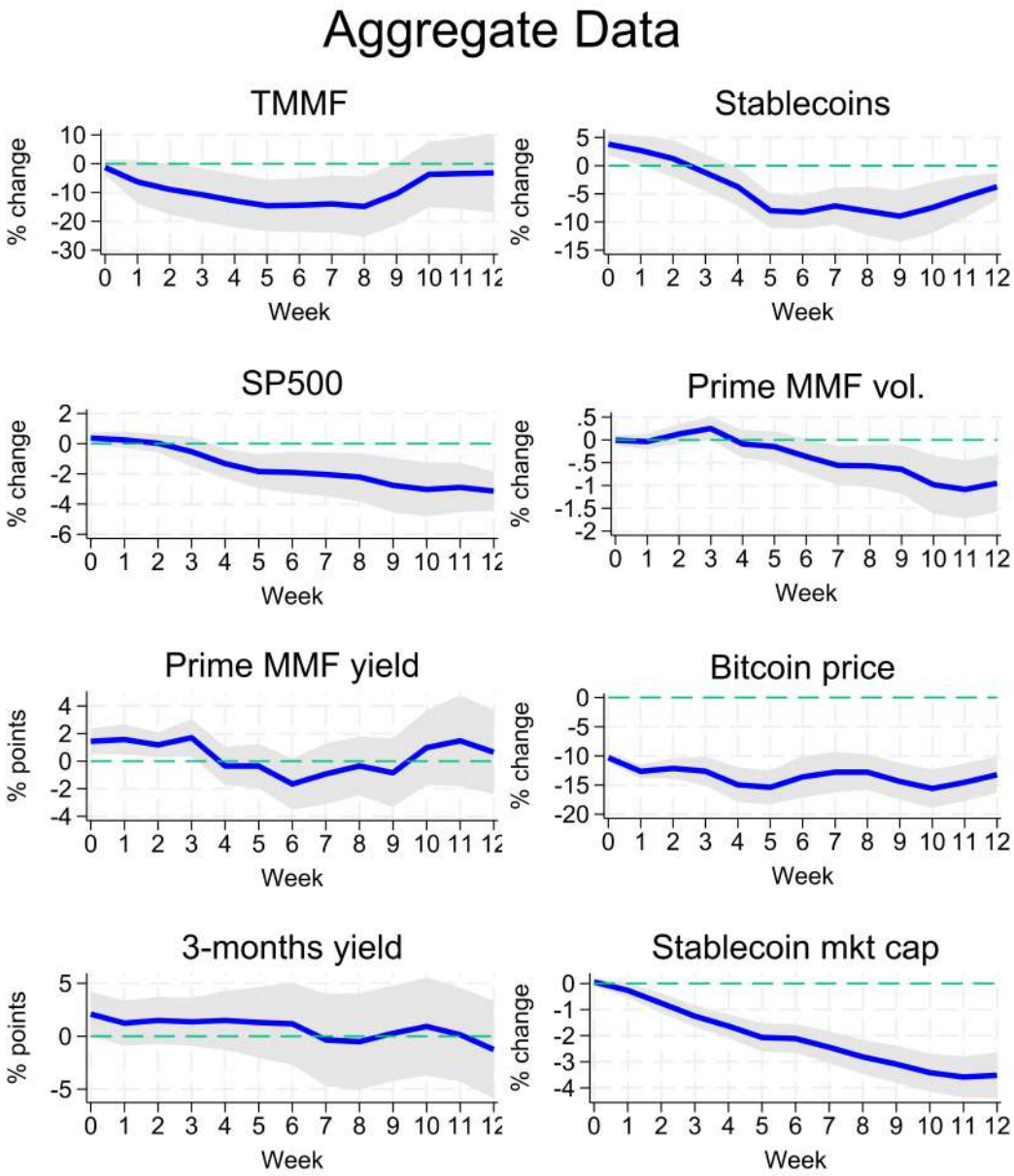


Figure 6.1: Local projection impulse response - Aggregate data. Local projection impulse response for wallet-aggregate TMMF and stablecoins holdings, and for market financial variables. The dependent variable is measured in long-differences. Estimation includes lags of dependent and control variables. Grey area indicates 68% confidence intervals. Weekly data. Full sample.

in the X_t vector as controls. Aggregate holdings of TMMF decrease following a crypto shock, though the decline is significant only at some horizons, and importantly, after 12 weeks there is no significant decline. Wallet-level holdings of stablecoins increase in the

first three weeks; however, at longer horizons, they cumulatively decrease by about 5% following a crypto shock. This dynamics is consistent with the behavior of the aggregate stablecoins market capitalization, which declines by a cumulative 4%. Among traditional finance assets, the impact of a crypto shock is negative and significant at longer horizons for the S&P 500 index and for the volume of prime MMF, and is not significant for the 3-month T-bill and the prime MMF yield.[8] Overall, we find that in the aggregate, TMMF volumes decrease at times of stress in the main cryptoasset markets, albeit with a low significance level. Stablecoin holdings, both within the balances held by TMMF holders and in the aggregate market capitalization, react negatively and significantly to negative cryptoasset shocks.

6.3 Wallet-level Panel Estimates

To assess whether, for individual investors, TMMFs and stablecoins represent a safe asset experiencing inflows at times of stress in cryptoasset markets, we estimate the wallet-level equation:

$$y_{i,t+h} = \mu_{i,h} + \beta_h^1 S_t + \sum_{j=1}^{J} X_{t-j}\Gamma_{j,h} + \sum_{j=1}^{J} Z_{i,t-j}\Pi_{i,j,h} + \varepsilon_{i,t+h} \tag{6.2}$$

where y_i indicates wallet-level balances of either TMMF or stablecoins, X_t represents aggregate control variables, and μ_i are wallet-level fixed effects. We report panel estimates for the sample starting on 1 January 2024, when the TMMF TVL had reached

[8]The Appendix reports results also for the sample starting in January 2024, which is the sample used in the panel estimation sections.

approximately 800 million USD, and in our sample, the number of wallets with positive average balances reaches a count above 1000. BUIDL, which would later become the largest TMMF, entered the market at the end of the first quarter in 2024.

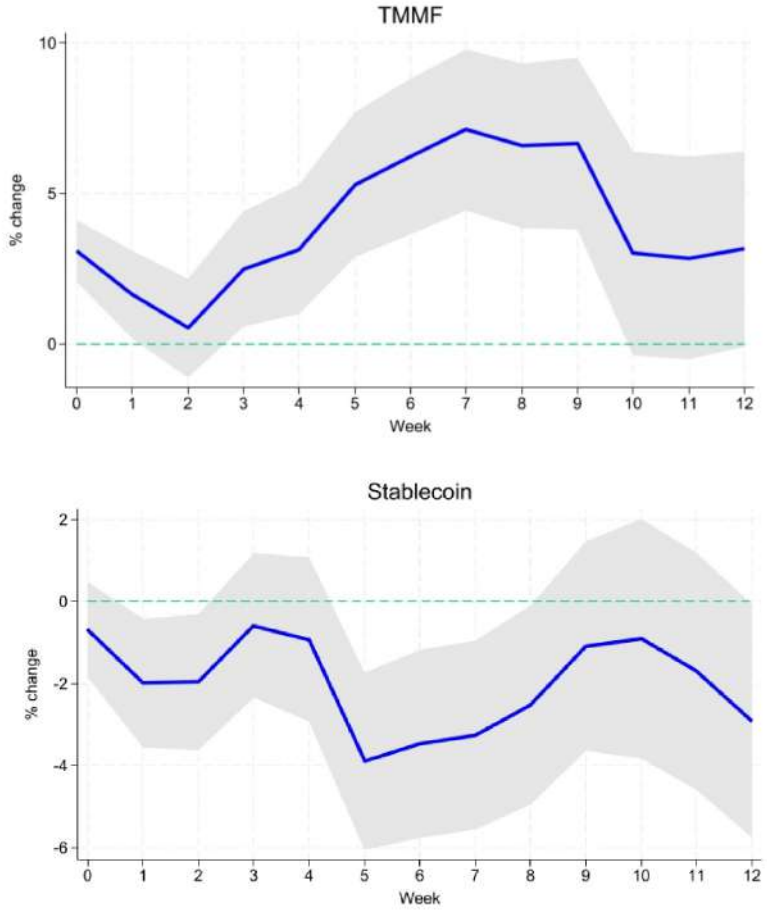


Figure 6.2: Panel local projection impulse response for wallet-level variables. Dependent variable is measured in long-differences. The estimation includes wallet-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

Figure 6.2 shows the panel-LP estimated IR for TMMF and stablecoins. TMMFs react *positively* to the cryptoasset shock, which depresses the value of Bitcoin by 10% on impact, behaving like a safe asset. The increase at the wallet level reaches its maximum

of 7% in weeks 7-9 after the shock. The second panel shows that stablecoin balances by the same wallet-holders react *negatively* after the shock, though the IR is significant only at a few horizons. Hence, we have evidence that TMMFs, rather than stablecoins, are perceived as the safe havens of digital markets, serving as stores of value.

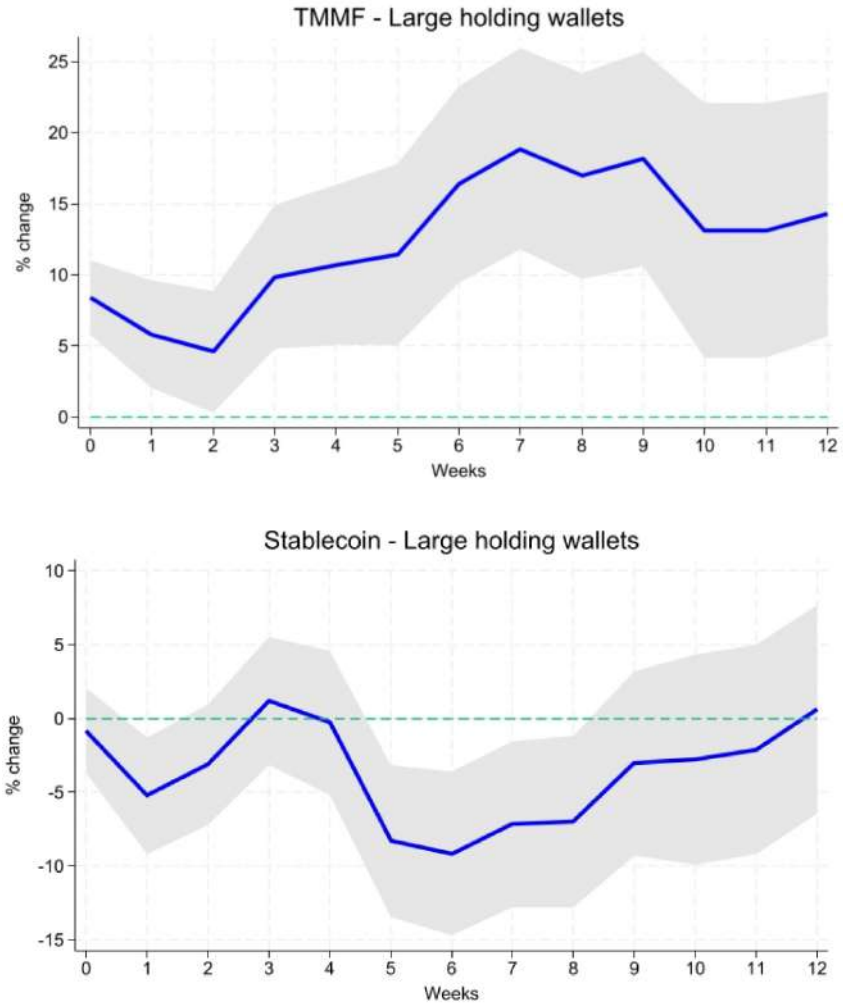


Figure 6.3: Large holding wallets - Panel local projection impulse response for wallet-level variables. Includes only wallets with average holdings of TMMF above 10,000 USD. The dependent variable is measured in long-differences. The estimation includes wallet-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

To discriminate across the behavior of individual investors with different characteris-

tics, we repeat the estimation of eq. (6.7) for wallets with an average balance of TMMF holdings above 10,000 USD over the sample. This corresponds to about 29% of all the individual wallets in the sample.[9] The top panel of Figure 6.3 shows that for these investors the TMMF holdings increase cumulatively by 15% over the 12-week horizon after a negative cryptoasset shock, rising on impact by 7%. Conversely, stablecoin holdings fall by up to 10%, mirroring the pattern observed in the estimation across all wallets, and the change in stablecoin holdings becomes non-significant after nine weeks.

6.4 Extensive and Intensive Margin: Reconciling Wallet Panel and Aggregate Estimates

The panel-LP estimated IR for TMMF show that TMMFs react *positively* to the cryptoasset shock, which depresses the value of Bitcoins by 10% on impact, whereas the LP estimates for the aggregate universe of the wallet report a *fall* in TMMFs holding following the same shock. The two estimations correspond to different estimands: the aggregate LP is mechanically value-weighted and therefore dominated by large-balance wallets and activity-margin shifts, while the fixed-effects panel identifies the average within-wallet response.

We investigate the hypothesis that - even with the wallet universe fixed once and for all - the aggregate TMMF series can fall after a shock if shocks reduce the probability

[9]The sample starting at January 2024 includes 1652 wallets which have at some t non-zero TMMF balance. Of these, 29% have an average TMMF balance larger than 10,000 USD, and 20% have an average balance larger than 100,000 USD. About 17% of wallets have average balances of both TMMF and stablecoins above 10,000 USD for each asset. About 20% of wallets have minimal TMMF balances (less than 5 USD), possibly because the sample includes average weekly holdings, and we have evidence from the daily dataset that a non-negligible number of investors engage in intra-daily operations, resulting in zero end-of-day balance.

that zero-balance wallets become active, or increase the probability that active wallets return to zero, even if conditional balances among active wallets rise.

To assess the relative impact of a crypto-asset shock on within-wallet change in balance (intensive margin) and on entry into the TMMF market by new investors (extensive margin), we model the response of TMMFs' wallets following a two-part specification separating the probability of a wallet being 'active' from the change in wallet balance conditional on a wallet being 'active'.

To assess the behavior of the extensive margin, we estimate a panel linear probability model with wallet fixed effects using the LP specification. Let $H_{i,t}$ denote TMMF holdings of wallet i at week t, with fixed wallet universe $i = 1, \ldots, N$. Define $\mathbf{1}(H_{i,t} > 0)$ as the indicator variable for a wallet to be active. We define an active wallet as a wallet that at time t moves from having zero balance to having a positive balance. This definition distinguishes between investors changing average holdings (intensive margin), and investors deciding to hold a non-zero balance (extensive margin).

The estimation equation is:

$$\mathbf{1}(H_{i,t+h} > 0) = \mu_{i,h} + \beta_h^1 S_t + \sum_{j=1}^{J} X_{t-j}\Gamma_{j,h} + \sum_{j=1}^{J} Z_{i,t-j}\Pi_{i,j,h} + \varepsilon_{i,t+h} \tag{6.3}$$

Figure 6.4 reports at each horizon the average within-wallet *change* in the probability of a wallet being active in the TMMF market after a crypto-asset negative shock lowering the price of a Bitcoin by 10 percent.[10] The share consistently falls at each horizon,

[10]The IRF is reported in probability units. As is common in linear probability models, the change in probability can exceed 100 percentage points.

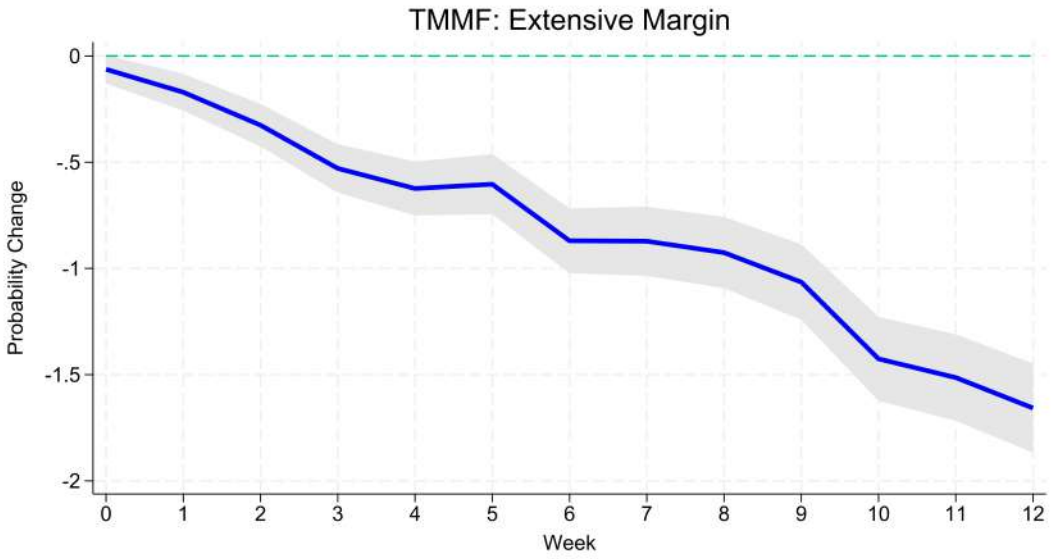


Figure 6.4: Linear probability model panel local projection impulse response for wallet-level variables. Dependent variable is measured in long-differences. The estimation includes wallet-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

implying the probability of a wallet becoming active falls at every horizon h.

To measure the intensive margin, we estimate the equation:

$$y_{i,t+h} \big| \; H_{i,t+h} > 0 = \mu_{i,h} + \beta_h^1 S_t + \sum_{j=1}^{J} X_{t-j} \Gamma_{j,h} + \sum_{j=1}^{J} Z_{i,t-j} \Pi_{i,j,h} + \varepsilon_{i,t+h} \tag{6.4}$$

Figure 6.5 reports that conditional on a wallet being active, the balance within the wallet increases following a rise in the stress within crypto-markets. The impulse response is negative for some horizons between the 5th and the 11th week following the shock. One possible explanation for this behavior is heterogeneity in wallet sizes, with occasional outliers in specific weeks when a few wallets account for more than 80 percent of the market, leading to large jumps in aggregate holdings.

We then assess the impact of the disaggregation across the extensive and intensive

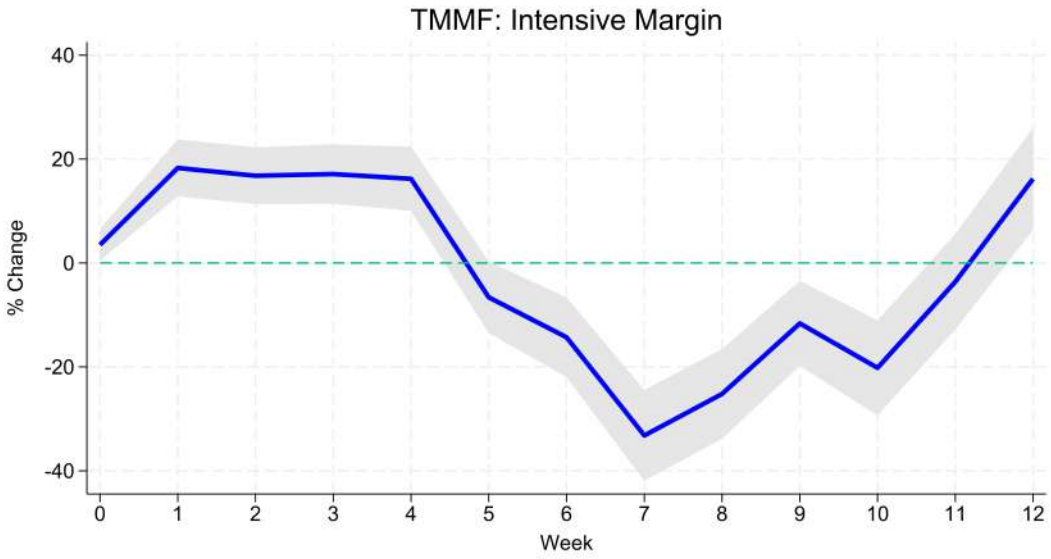


Figure 6.5: Panel local projection impulse response for wallet-level variables. The dependent variable is measured in long differences and is defined as wallet holding, conditional on the wallet being active. The estimation includes wallet-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

margins in the aggregate estimates. Define aggregate wallet holdings as:

$$A_t = \sum_{i=1}^{N} H_{i,t}.$$

The aggregate series can be written as:

$$A_t = N \cdot p_t \cdot \bar{H}_t^+,$$

where N is the fixed number of wallets in the universe, $p_t = \frac{1}{N} \sum_i \mathbf{1}(H_{i,t} > 0)$ is the share of active TMMF wallets, and the mean TMMF aggregate balance conditional on being

active is given by:

$$\bar{H}_t^+ = \frac{\sum_i H_{i,t}}{\sum_i \mathbf{1}(H_{i,t} > 0)} \tag{6.5}$$

We then evaluate the impact of a crypto-asset shock using the LP estimate for the activation share and the conditional balance, using the estimated equations:

$$p_{t+h} = \alpha_h + \beta_h^1 S_t + \sum_{j=1}^{J} X_{t-j}\Gamma_{j,h} + \sum_{j=1}^{J} Z_{t-j}\Pi_{j,h} + \varepsilon_{t+h} \tag{6.6}$$

and

$$\bar{H}_{t+h}^+ = \mu_{i,h} + \beta_h^1 S_t + \sum_{j=1}^{J} X_{t-j}\Gamma_{j,h} + \sum_{j=1}^{J} Z_{i,t-j}\Pi_{i,j,h} + \varepsilon_{i,t+h} \tag{6.7}$$

Figure 6.6 clarifies that in the aggregate the negative response of TMMF weekly balances is given by the combination of a slower entry into the market (a negative activation margin), and a shift towards TMMF hodings for those investors already holding a positive TMMF balance.

Our results are consistent with the hypothesis that the aggregate decline in TMMF balances after a crypto shock is not driven by active holders reducing allocations. Instead, it reflects a contraction in market participation on the extensive margin—primarily weaker-than-usual entry into TMMFs—while incumbent wallets rebalance toward TMMFs within their portfolios.

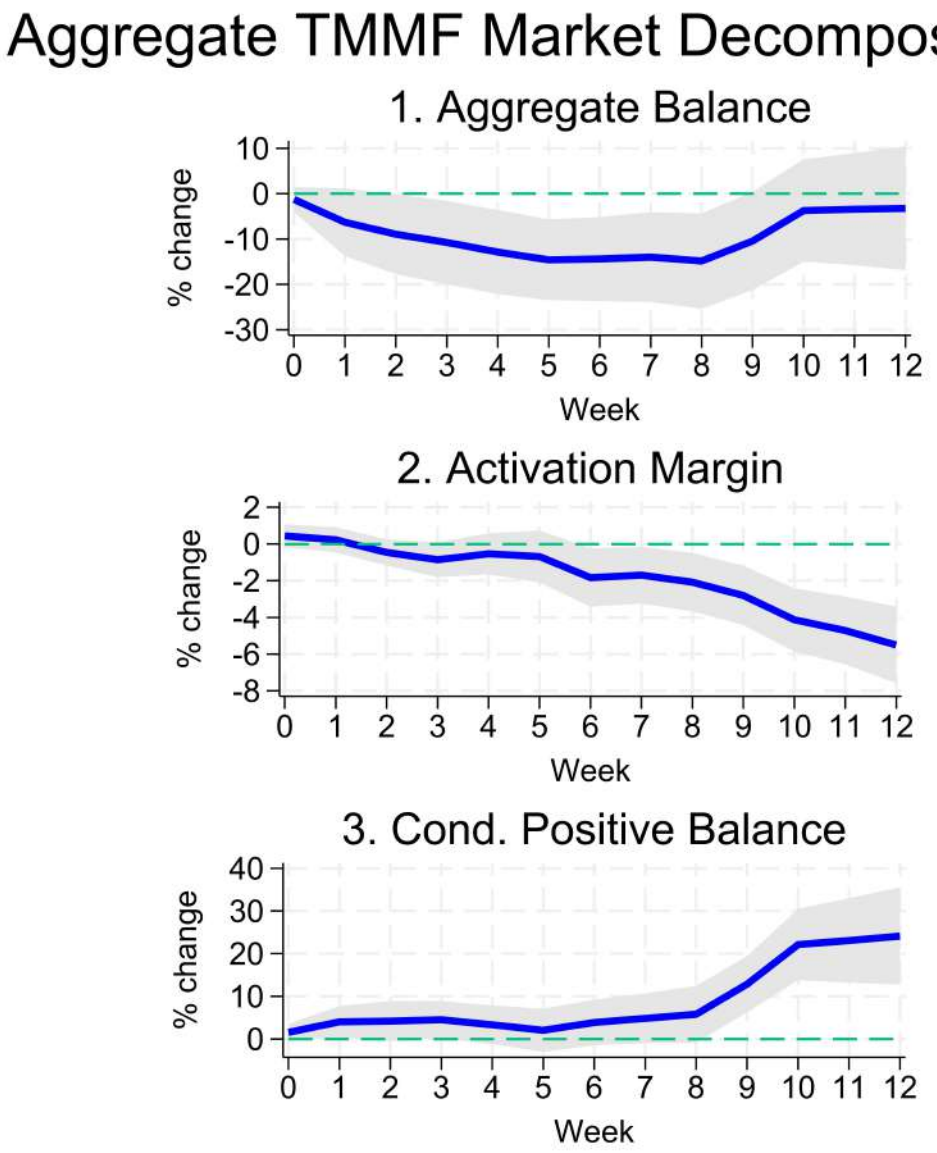


Figure 6.6: Local projection impulse response - Aggregate data. Local projection impulse response for wallet-aggregate TMMF holdings (panel 1), for share of active wallets with non-zero balance (panel 2), and aggregate holdings of wallets conditional on being active. The dependent variable is measured in long-differences. The estimation includes lags for the dependent and control variables. Grey area indicates 68% confidence intervals. Weekly data. Full sample.

6.5 Wallet Rebalancing Panel Estimates

To distinguish total net inflow and outflow of cryptoassets into the wallet from pure within-wallet rebalancing, we estimate the following panel-LP specification

$$y_{i,t+h} = \mu^s_{i,h} + \beta^s_h S_t + \sum_{j=1}^{J} X_{t-j}\Gamma_{j,h} + \sum_{j=1}^{J} Z_{i,t-1}\Pi_{i,j,h} + \varepsilon_{i,t+h} \ , \tag{6.8}$$

where the dependent variable is the long-difference of the stablecoin share within wallet i:

$$y_{i,t+h} = \Delta_h \log(s^S_{i,t+h}) = \log(s^S_{i,t+h}) - \log(s^S_{i,t-1}).$$

The total wallet wealth and the stablecoin share are computed as follows:

$$W_{i,t} = TMMF_{i,t} + Stable_{i,t}$$
$$s^S_{i,t} = \frac{Stable_{i,t}}{W_{i,t}}$$

where $TMMF_{i,t}$ and $Stable_{i,t}$ denotes the TMMF and Stablecoins holdings of wallet i at time t. The TMMF share is $s^T_{i,t} = 1 - s^S_{i,t}$. We also estimate eq. (6.8) using the long-difference of logged total wealth as a dependent variable to assess the impact on the overall wallet balance.[11]

Figure 6.7 and Figure 6.8 show, respectively, for all wallets and for wallets with average TMMF balance above $10,000$ USD that the impact of a negative cryptoasset shock has no significant impact on the overall consistency of the total wallet balance, whereas it

[11] For similar specification in portfolio rebalancing empirical work, see Boddin et al. (2025) and Nenova (2025).

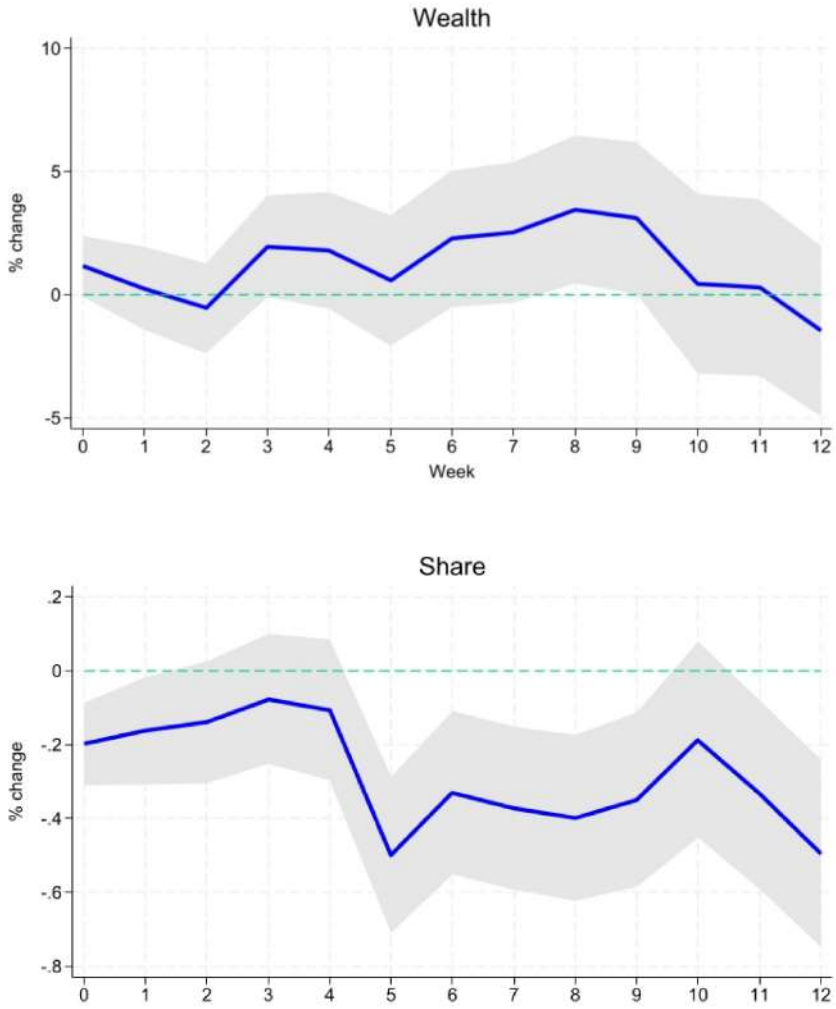


Figure 6.7: Rebalancing panel local projection impulse response. Rebalancing estimates for total wallet-level wealth and for stablecoin wealth-share. Panel local projection impulse response for wallet-level variables. The dependent variable is measured in long-differences. The estimation includes wallet-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025. All wallets are included.

impacts negatively the stablecoin share. The impact reaches approximately -0.5% in the all-wallets sample and -1% in the large-wallet sample. The result indicates a pure reshuffling impact of a crypto shock. Upon a surprise negative price development in the overall cryptoasset market, investors rebalance away from stablecoins and into TMMF,

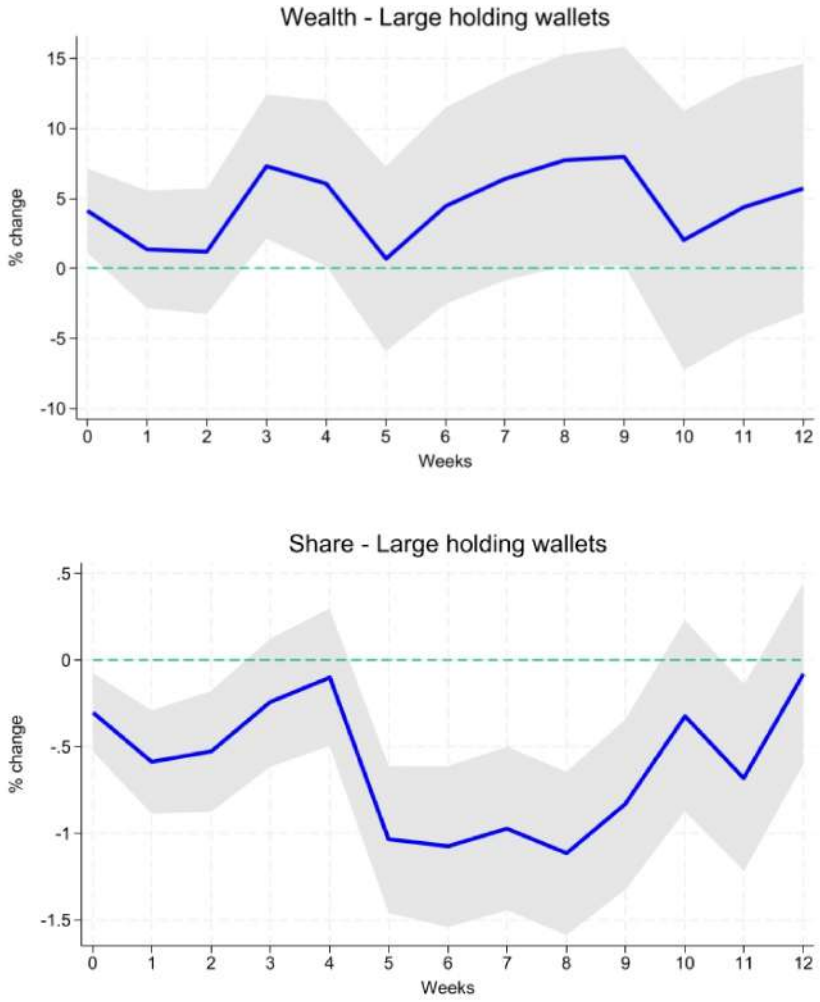


Figure 6.8: Rebalancing panel local projection impulse response - Large holdings wallet. Includes only wallets with average holdings of TMMF above 10,000 USD. Rebalancing estimates for total wallet-level wealth and for stablecoin wealth-share. Panel local projection impulse response for wallet-level variables. The dependent variable is measured in long-differences. The estimation includes wallet-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

with little change in total holdings.[12]

[12]At first sight, these figures may appear small; they are comparable to changes in trading behavior following shocks in traditional safe assets. For instance, examining the "Liberation Day" tariff shock in April 2025 and the U.S./Israel attacks on Iran in March 2026 reveals that changes in trading volumes range from 0.2% to 0.5%. Even in the deepest and most liquid safe-asset market, portfolio adjustments around shocks are quantitatively small relative to the stock of outstanding assets.

6.6 Three-dimensional Panel Rebalancing Estimates

Different investors' behavior may affect not only the overall wallet level but also the wallet-asset level. For example, an investor may seek exposure to cryptoassets overall, possibly using the total value of the wallet's assets as collateral for other cryptoasset transactions. However, an investor may instead prefer different exposures to the two assets in the wallet: a safe asset and a pledgeable stablecoin for crypto transactions with a higher risk profile.

To account for this heterogeneity across investors and assets, we estimate the within-wallet rebalancing using a three-dimensional (3D) panel specification. This allows the estimation to include $\mu_{i,j}$ wallet–asset fixed effects capturing persistent heterogeneity, such as wallet-specific tilt toward TMMF relative to stablecoins, and other time-invariant preferences (see Matyas (2017)).

Define the index $i = 1, \ldots, N$ to identify wallets, and the index $j \in \{1, 2\}$ to identify asset type, where we assume $j = 1$ indicates stablecoins and $j = 2$ indicates TMMFs. Using as a dependent variable the long-difference for TMMF and stablecoin holdings, we estimate for each horizon h:

$$
\begin{aligned}
y_{i,j,t+h} &= \alpha_h + \mu_{i,j} + \underbrace{\beta_h^{\text{scale}} S_t}_{common\ change} + \underbrace{\beta_h^{\text{reb}} (D_j^S - D_j^T) S_t}_{rebalancing\ tilt} + \\
&\quad + \sum_{l=1}^{Lag} X_{t-l} \Gamma_{l,h} + \sum_{l=1}^{Lag} Z_{i,j,t-l} \Pi_{i,j,l,h} + \varepsilon_{i,j,t+h} \qquad (6.9) \\
D_j^S &= 1\{j = 1\} \qquad (stablecoins) \\
D_j^T &= 1\{j = 2\} \qquad (TMMF)
\end{aligned}
$$

where α_h is a horizon-specific constant, $\mu_{i,j}$ is the wallet–asset fixed effect, $\beta_h^{scale,reb}$ is the IR at horizon h of a one-unit shock S_t on the cumulative percentage change in holdings of either both assets, or the specific $j-$asset.

Because $D_j^S - D_j^T$ is equal to $+1$ for stablecoins, and to -1 for TMMF, we obtain that for stablecoins ($j = 1$) and TMMFs ($j = 2$):

$$\Delta_h y_{i,1,t} = \cdots + (\beta_h^{\text{scale}} + \beta_h^{\text{reb}})\varepsilon_t + \cdots$$

$$\Delta_h y_{i,2,t} = \cdots + (\beta_h^{\text{scale}} - \beta_h^{\text{reb}})\varepsilon_t + \cdots$$

We can then interpret β_h^{scale} as the symmetric scale effect, that is, the size of the movement common to both assets when the shock hits, and β_h^{reb}as the rebalancing effect, or how much the shock tilts the wallet from one asset to the other. The coefficient β_h^{reb} will be negative if the rebalancing happens *away* from stablecoins and *towards* TMMFs.

Figure 6.9 and Figure 6.10 report the IR estimated from the 3D panel specification, for all wallets and for wallets with average holdings of TMMFs above $10,000$ USD. The results are consistent with a flight-to-safety behavior towards TMMFs. The wallet tilt *towards* TMMFs increases by up to 4% in the all-wallets sample and is larger, reaching 10% for wallets with large average holdings. Including the wallet-asset fixed effects results in a scale effect - an increase in the overall portfolio size - of about 7% for large-holdings wallets, while the scale effect is not significant when including all wallets.

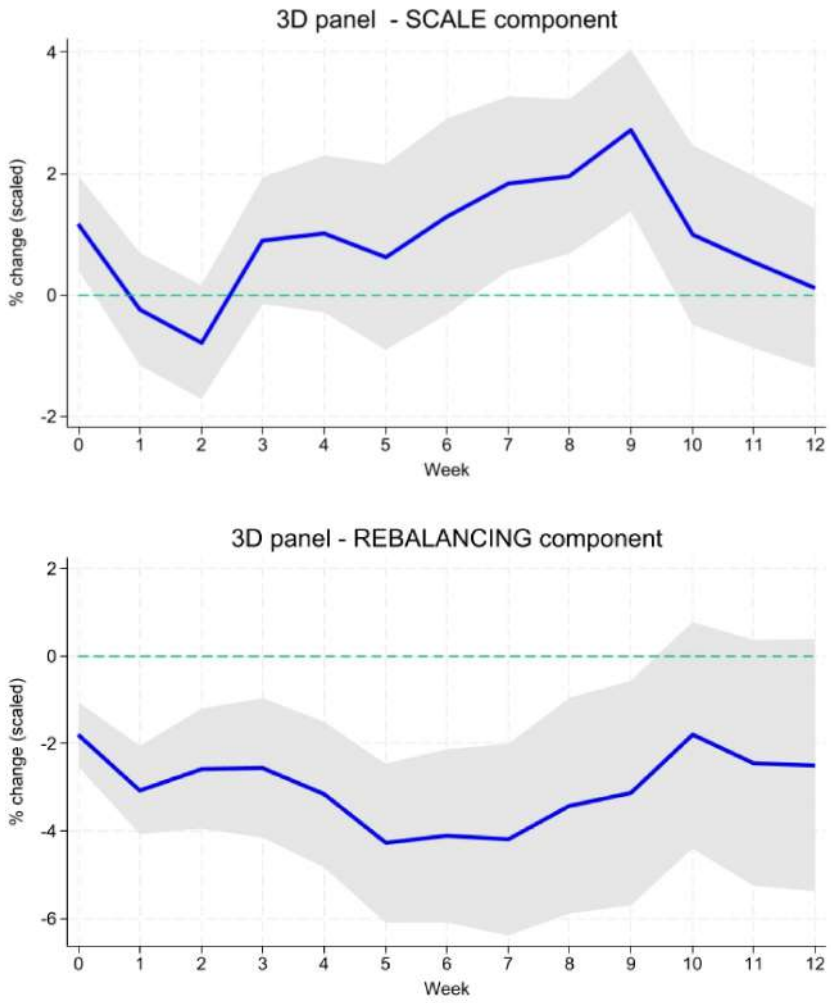


Figure 6.9: 3D panel rebalancing local projection impulse response. 3D panel rebalancing estimates for total wallet-level wealth and for stablecoin wealth-share. Panel local projection impulse response for wallet-level variables. The dependent variable is measured in long-differences. The estimation includes wallet-asset-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025. All wallets are included.

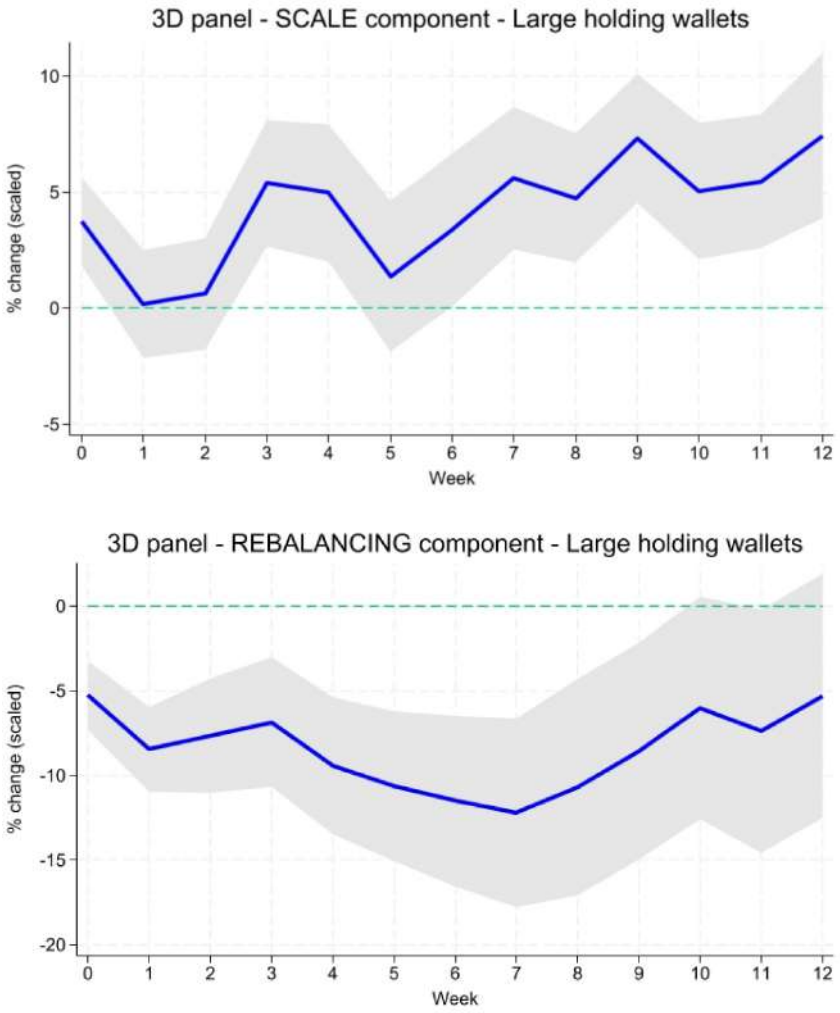


Figure 6.10: 3D panel rebalancing local projection impulse response - Large holding wallets. Includes only wallets with average holdings of TMMF above 10,000 USD. 3D panel rebalancing estimates for total wallet-level wealth and stablecoin wealth share. Panel local projection impulse response for wallet-level variables. The dependent variable is measured in long-differences. The estimation includes wallet-asset-level fixed effects, a time trend, and lags of the dependent and control variables. Standard errors are two-way clustered by time and wallet. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

7 Conclusion

Tokenization has reached a stage where it meaningfully integrates traditional financial assets into blockchain-based markets. Among tokenized real-world assets, TMMFs are particularly important, as they combine the safety and liquidity of conventional money market funds with the transparency and programmability of blockchains. In doing so, they create a bridge between traditional finance and digital asset markets.

Using aggregate and wallet-level on-chain data, we show that TMMFs play a distinct role in the crypto-financial ecosystem. While aggregate holdings of both stablecoins and TMMFs decline after adverse crypto-market shocks, this effect is driven by the extensive margin. At the wallet level, TMMF holdings increase while stablecoin holdings fall, especially for larger wallets, consistent with investors perceiving TMMFs as safer. This behavior reflects a functional distinction akin to classic monetary theory: stablecoins primarily serve as a medium of exchange, facilitating trading but offering no yield or safety assurances, whereas TMMFs are yield-bearing, institutionally anchored instruments that function as a store of value, particularly during periods of market stress.

The rapid growth of TMMFs highlights their increasing importance. As total value locked has expanded by an order of magnitude in under two years and major asset managers issue tokenized funds at scale, TMMFs are well-positioned to become a core safe asset in digital finance, supporting deeper institutional participation and the continued growth of tokenized markets.

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Appendix A Additional Tables

A.1 Description of the Funds

Ticker	Address	Website
BUIDL	0x7712c34205737192402172409a8f7ccef8aa2aec 0x6a9da2d710bb9b700acde7cb81f10f1ff8c89041	https://www.blackrock.com/
FDIT	0x48ab4e39ac59f4e88974804b04a991b3a402717f	https://www.fidelity.com/
JTRSY	0x8c213ee79581ff4984583c6a801e5263418c4b86	https://www.janushenderson.com/
OUSG	0x1b19c19393e2d034d8ff31ff34c81252fcbbee92	https://ondo.finance/ousg
TBILL	0xdd50c053c096cb04a3e3362e2b622529ec5f2e8a	https://docs.openeden.com/
ULTRA	0x50293dd8889b931eb3441d2664dce8396640b419	https://libeara.com/press-release3/
USDY	0x96f6ef951840721adbf46ac996b59e0235cb985c	https://ondo.finance/usdy
USTB	0x43415eb6ff9db7e26a15b704e7a3edce97d31c4e	https://superstate.co/ustb
USTBL	0xe4880249745eac5f1ed9d8f7df844792d560e750	https://www.spiko.xyz/
USYC	0x136471a34f6ef19fe571effc1ca711fdb8e49f2b	https://usyc.hashnote.com/
WTGXX	0x1fecf3d9d4fee7f2c02917a66028a48c6706c179	https://www.wisdomtree.com/
BENJI	0x3ddc84940ab509c11b20b76b466933f40b750dc9	https://www.franklintempleton.com/

Table A.1: Token Addresses. The table provides the Ethereum token addresses and the website of the project of the TMMFs.

	Management Fees	Subscription Fees	Redemption Fees	Min. Invest	Eligible Investors
BUIDL	50	0	0	5,000,000.00	U.S. QP
FDIT	20	0	0	1,000,000.00	InstI
JTRSY	25	0	0	100,000.00	ProfI
OUSG	15	0	0	100,000.00	U.S. QP
TBILL	0	0	5	100,000.00	U.S. AI, ProfI
ULTRA	32	0	45	200,000.00	InstI, AI
USDY	0	0	0	0.00	Non-U.S. I
USTB	15	0	0	100,000.00	U.S. AI
USTBL	25	0	0	1,000.00	U.S., Glob. Retail
USYC	0	0	0	100,000.00	U.S. QP, Non-U.S. I
WTGXX	25	0	0	0.00	U.S. Retail, InstI

Table A.2: TMMFs – Fees, Minimum Investments and Investor Qualification. This table displays the fees (bps), that is, management fees, subscription fees, and redemption fees, the minimum investment amounts (in USD), and the investor qualification as of September 16, 2025. For clarity, the following abbreviations are used in the table: Institutional Investor (InstI), U.S. Qualified Purchaser (U.S. QP), U.S. Accredited Investor (U.S. AI), Professional Investor (ProfI), Accredited Investor (AI), Non-U.S. Investor (Non-U.S. I), and U.S. and Global Retail (U.S. and Glob. Retail). The data is sourced from rwa.xyz.

Metric	Total Number	Mean Amount (USD)	Median Gas Fees (USD)
Panel A: Mints			
BUIDL	4870	886,856.79	26.86
FDIT	14	14,548,979.23	1.00
JTRSY	14	29,622,986.99	0.42
OUSG	435	2,729,540.73	7.36
TBILL	310	1,201,523.50	2.14
ULTRA	19	3,416,331.75	0.15
USDY	590	2,276,436.17	3.20
USTB	636	6,323,082.35	0.51
USTBL	30	1,978,962.58	0.97
USYC	8977	276,920.86	6.77
WTGXX	216	8,730,895.42	0.45
BENJI	1331	186,010.03	0.82
Panel B: Burns			
BUIDL	163	13,989,732.27	2.03
FDIT	10	14.93	0.50
JTRSY	9	11,681,794.65	0.50
OUSG	478	1,389,204.08	11.22
TBILL	204	1,050,693.36	6.69
ULTRA	3	17,025.67	0.12
USDY	420	2,196,973.59	2.31
USTB	1980	1,428,029.77	1.57
USTBL	16	1,138,446.87	1.19
USYC	4551	518,208.33	0.56
WTGXX	44	5,630,101.73	0.67
BENJI	18	9,181,929.66	0.55
Panel C: Transfers			
BUIDL	2806	1,928,967.01	9.09
FDIT	10	20,368,578.00	0.47
JTRSY	27	37,480,405.60	1.20
OUSG	562	1,220,051.23	10.67
TBILL	388	1,210,725.57	1.84
ULTRA	27	2,276,580.35	0.54
USDY	2681	222,139.30	5.38
USTB	1922	192,828.91	1.67
USTBL	42	519,715.34	1.23
USYC	24101	299,230.15	12.78
WTGXX	48	343.52	1.43
BENJI	4	10.00	0.84

Table A.3: TMMFs – Transactions and Gas Fees. The table reports the number of transactions (Total Number), their average amounts in USD (Average Amounts (in USD))) and the associated median gas fees (in USD) (Gas Fees) for Mints (Panel A), Burns (Panel B), Transfers (Panel C) for the selected TMMFs. The data for each token ranges from the inception to 17-09-2025.

A.2 Additional Evidence on Shock Exogeneity

A potential concern is that institutional reallocations may affect both crypto prices and TMMF inflows. We consider this unlikely for two reasons. First, the BGCI is a broad index dominated by major cryptoassets, so reallocations into TMMFs are small relative to the aggregate crypto market and unlikely to materially affect index-level innovations. Second, TMMFs remain a small, institutionally restricted segment of digital finance, with participation limited by KYC/AML requirements, allow-listing, and, at times, high minimum investment thresholds.

A related concern is that TMMF adoption may be correlated with broader trends in market volatility. Our identification instead relies on weekly variation in unexpected crypto returns rather than on slow-moving adoption dynamics. In addition, the wallet-level evidence points to within-wallet substitution rather than aggregate inflows: after a negative crypto shock, TMMF holdings rise while stablecoin holdings fall, with little change in total wallet wealth. This pattern is difficult to reconcile with a common-trend explanation.

We further test whether the identified crypto shock is related to observable demand shifters that could directly influence the relative demand for TMMFs and stablecoins. We regress the shock series on daily measures of TMMF yields, stablecoin market capitalization growth, TMMF market capitalization growth, stablecoin transfer volume growth on Ethereum, and broader financial and crypto-market conditions, proxied by changes in ON RRP, the VIX, and BTC options volume on Deribit. Table A.4 shows that none

of these variables significantly explains the shock in univariate specifications. In the joint specification, the controls are also jointly insignificant ($p = 0.480$) and have low explanatory power ($R^2 = 0.026$). Overall, the results suggest that the identified shock is not systematically driven by observable shifts in stablecoin demand, tokenized Treasury demand, yield conditions, or broader market volatility.

	Individual regressions							Joint regression
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specification								
TMMF apy	-0.0000							-0.0000
	(0.0000)							(0.0000)
Δ log(Stablecoin mkt cap)		0.0495						-0.4670
		(0.1340)						(0.5657)
Δ log(TMMF mkt cap)			0.0179					-0.0926
			(0.0118)					(0.0843)
Δ log(Stablecoin volume)				-0.0128				0.0166
				(0.0137)				(0.0326)
Δ(ON RRP)					-0.0001			-0.0000
					(0.0001)			(0.0001)
VIX						-0.0006		-0.0006
						(0.0006)		(0.0014)
Δ log(BTC options volume)							-0.0097	0.0066
							(0.0148)	(0.0173)
Constant	0.0031	-0.0005	-0.0032	0.0006	-0.0020	0.0120	-0.0032	0.0210
	(0.0088)	(0.0048)	(0.0053)	(0.0046)	(0.0063)	(0.0135)	(0.0054)	(0.0303)
Observations	146	357	215	357	180	339	242	111
R^2	0.003	0.000	0.003	0.003	0.003	0.002	0.004	0.026
Joint F-test p-value								0.480

Table A.4: Exogeneity of the crypto shock measure. This table reports regressions of the identified crypto shock on proxies for omitted demand shifts. Columns (1)–(7) include each proxy separately, while column (8) includes all controls jointly. TMMF APY is the average 7-day APY across TMMFs reported by rwa.xyz. Stablecoin market cap is the aggregate market capitalization of tokenized stablecoins. Tokenized Treasury market cap is the aggregate market capitalization of TMMFs. Stablecoin volume is the daily dollar value of stablecoin transfers on the Ethereum network. ON RRP is the Federal Reserve overnight reverse repo balance. VIX is the CBOE Volatility Index. BTC options volume is the daily Bitcoin options volume from Deribit. Variables are included in levels for TMMF APY and VIX, in first differences for ON RRP, and in log-differences for market capitalization and volume measures. HAC/Newey-West standard errors with 5 lags are reported in parentheses.

Appendix B Additional Figures

Figure B.2 displays the TVLs for the TMMFs over time. As visible, most charts display a strong growth in TVL.

Appendix C Details on TMMFs

C.1 BUIDL

BUIDL, managed by BlackRock, invests pooled client funds in short-term instruments such as overnight repurchase agreements and U.S. Treasury bills to generate yield, while targeting a stable 1 USD token value. Dividends accrue daily and are distributed monthly as additional tokens directly to investor wallets. Each BUIDL token represents a security interest in the fund and can be transferred at any time between pre-approved investors. Fund assets are custodied by BNY Mellon, while Securitize LLC, an SEC-registered transfer agent, serves as the on-chain administrator, recording ownership and managing tokenized shares on the Ethereum blockchain. BUIDL supports both USD and USDC for subscriptions and redemptions, enabling streamlined on-chain interactions for investors alongside traditional settlement rails.

C.2 FDIT

The Fidelity Digital Interest Token (FDIT) is a tokenized representation of a share in the Fidelity Treasury Digital Fund (FYOXX). The fund's primary objective is to preserve capital and liquidity while generating a high level of current income. To achieve this, it

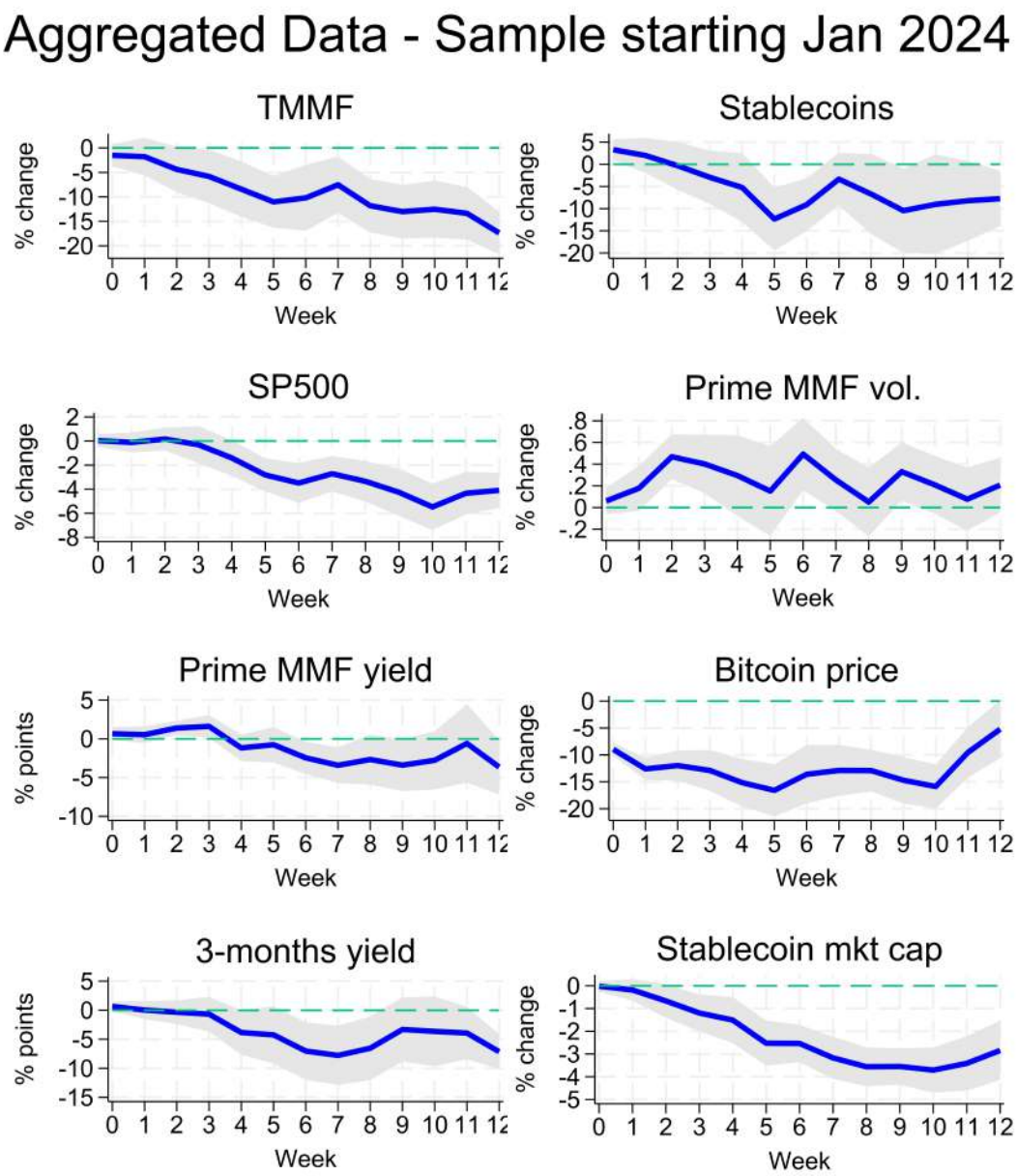


Figure B.1: Local projection impulse response - Aggregate data - Sample Starting January 2024. Local projection impulse response for wallet-aggregate TMMF and stablecoins holdings, and for market financial variables. The dependent variable is measured in long-differences. Estimation includes lags of dependent and control variables. Grey area indicates 68% confidence intervals. Weekly data. Sample: January 2024 to October 2025.

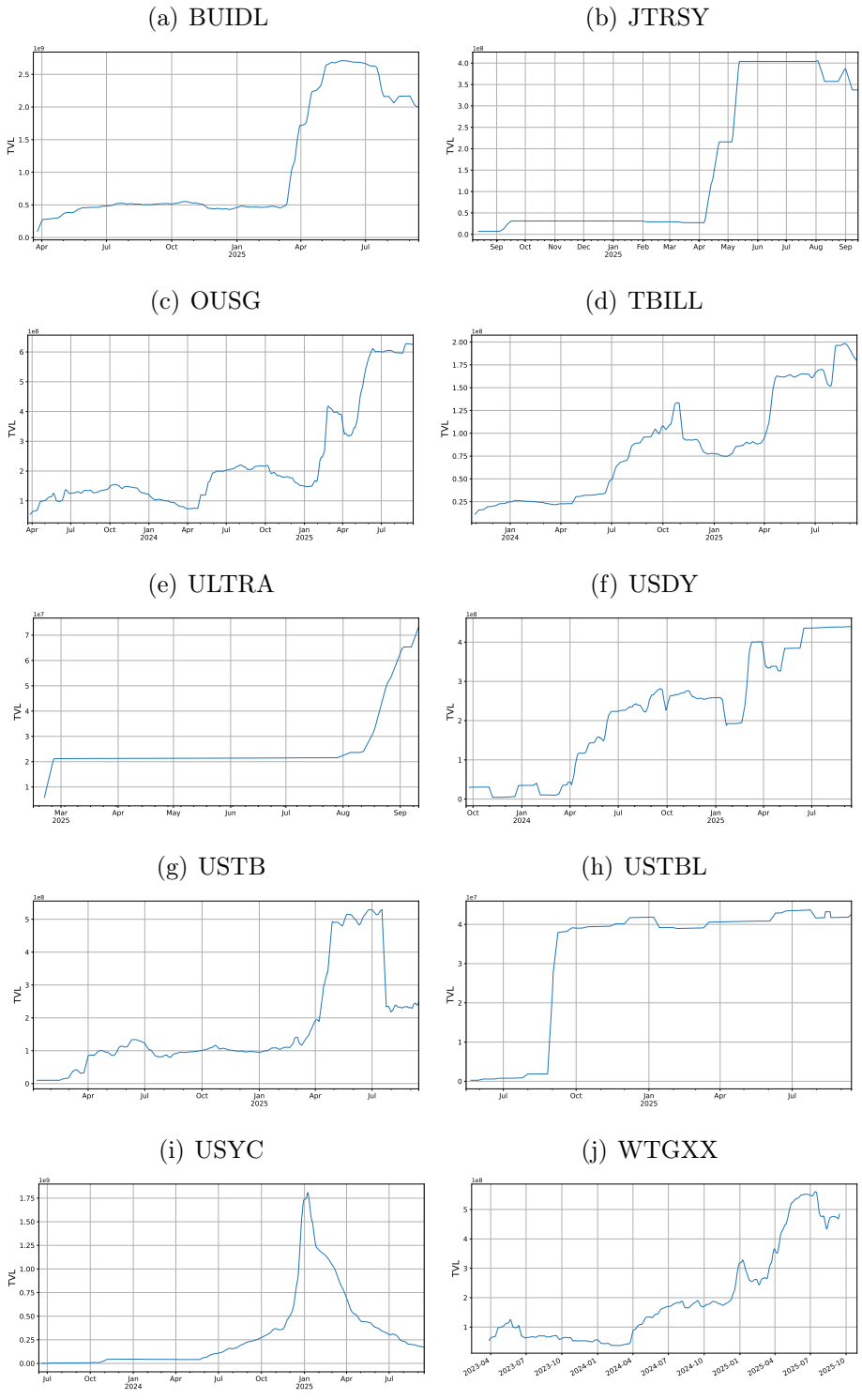


Figure B.2: TMMFs – TVL over Time. The figure shows the TVL of each TMMF over time. The data is sourced from rwa.xyz.

maintains a conservative investment strategy, allocating at least 99.5% of its total assets to cash and U.S. Treasury securities. This structure positions FDIT as a digital asset that provides exposure to the safety and yield of short-term U.S. government obligations.

C.3 JTRSY

The Janus Henderson Anemoy Treasury Fund (JTRSY) is a tokenized U.S. Treasury fund offering stable income, capital preservation, and liquidity through short-term government securities, issued across Ethereum, Base, Arbitrum, and Celo. Managed with institutional-grade governance, it holds the highest rating ever for a tokenized fund, AA+f/S1+ from S&, alongside Aa from Moody's and A+ from Particula, underscoring its robust operations and the growing credibility of blockchain-enabled investment products.

C.4 OUSG

The Ondo Short-Term US Government Treasuries Token (OUSG) offers liquid exposure to short-term US Treasuries with 24/7 tokenized subscriptions and redemptions. Currently, most of the portfolio is invested in BUIDL, with the rest allocated to BlackRock's FedFund (TFDXX), bank deposits, and USDC for liquidity. OUSG shares are transferable 24/7. Similar to USYC, OUSG comes in two versions: an accumulating version (OUSG), and a rebasing version (rOUSG). The OUSG token can be used in lending protocols such as Flux[13] to generate additional yields.

[13]https://fluxfinance.com/

C.5 TBILL

The OpenEden TBILL token (TBILL) is a direct, on-chain representation of U.S. Treasury Bills. Each token is backed 1:1 by T-Bills held in a dedicated vault at a U.S.-regulated financial institution, providing transparent exposure to this traditional asset class. Operating on the OpenEden platform, the TBILL Vault enables investors to earn yield from short-term U.S. government debt directly on the blockchain, combining the safety and stability of Treasuries with the accessibility and efficiency of digital assets.

C.6 ULTRA

The Delta Wellington Ultra Short Treasury On-Chain Fund (ULTRA) is launched in collaboration with Wellington Management, a global investment firm overseeing more than $1 trillion in assets. The ULTRA Fund invests exclusively in U.S. Treasury securities with maturities of less than one year, aiming to deliver returns that exceed the ICE BofA 3-Month U.S. Treasury Bill Index while preserving capital and maintaining liquidity. Tokenized units of the fund are accessible via USDC and fiat currency, initially issued on Ethereum and planned to expand to Arbitrum, Avalanche, and Solana. This initiative enhances transparency, operational efficiency, and liquidity for accredited and institutional investors, with early backing from key web3 entities including Mountain Protocol, Drift, and Ondo Finance, which will support intraday redemptions.

C.7 USDY

US Dollar Yield Token (USDY) is a tokenized note backed by short-term U.S. Treasuries and bank deposits, designed to provide non-U.S. investors with stablecoin accessibility and U.S. dollar-denominated yield. Interest accrues on the deposit, with transferable tokens minted after 40–50 days, depending on the investment timing. Redemptions are in USD via bank wire to non-U.S. accounts. USDY comes in two forms: the accumulating version (USDY), where token price rises as yield accrues, and the rebasing version (rUSDY), which stays at 1 USD while balances increase daily on business days. Holders can convert seamlessly between the two.

C.8 USTB

The Superstate Short Duration US Government Securities Fund (USTB) invests in short-term U.S. Treasury Bills, aiming for returns aligned with the federal funds rate. Fund shares are issued as USTB, a yield-bearing ERC-20 token. USTB can be transferred between whitelisted Ethereum addresses, with purchases and redemptions available in USD or USDC on market days.

C.9 USTBL

The Spiko US T-Bills Money Market Fund (USTBL) aims to deliver returns by investing solely in U.S. Treasury Bills with maturities of less than 6 months. The portfolio's average maturity is capped at 2 months, with up to 10% held in USD for seamless deposit and withdrawal processing. Spiko also offers tokenized Treasury Bills issued by Eurozone

Member States (EUTBL).

C.10 USYC

US Yield Coin (USYC) is the on-chain representation of Hashnote's Short Duration Yield Fund (SDYF), which invests primarily in short-term U.S. Treasury bills and participates in repurchase and reverse repurchase agreements. The token can be purchased or redeemed using either USD or PayPal USD (PYUSD), offering investors flexibility in settlement options.

C.11 WTGXX

WisdomTree Government Money Market Digital Fund (WTGXX) is a tokenized money market fund offering stable income, capital preservation, and a fixed $1.00 NAV. With a $1 minimum investment and a 0.25% expense ratio, it's available to non-accredited investors via the WisdomTree Prime app. While it does not invest in blockchain assets, it uses multiple blockchains for secondary share recordkeeping.

Appendix D A Look under the Hood of TMMFs

D.1 OUSG

OUSG (Ondo Short-Term US Government Treasuries) offers liquid exposure primarily to short-term U.S. Treasuries, with the majority of its portfolio currently allocated to the Fidelity Treasury Digital Fund (FYHXX) and the BlackRock USD Institutional Digital Liquidity Fund (BUIDL). The remainder is held in Franklin Templeton's Franklin

OnChain U.S. Government Money Fund (FOBXX), the WisdomTree Government Money Market Digital Fund (WTGXX), FundBridge Capital Delta Wellington Ultra Short Treasury On-Chain Fund (ULTRA), the Fidelity Treasury Digital Fund - OnChain Class (FYOXX), and the iShares Short Treasury Bond ETF (SHV), along with cash deposits and USDC for liquidity.

In Figure D.1, the average holdings in percentage are presented. The portfolio is primarily allocated to short-term U.S. Treasury and money market instruments, with FYOXX and BUIDL as the largest holdings at approximately $202.68 million (21.8%) and $173.52 million (18.6%). WTGXX and FYHXX follow with around $161.56 million (17.3%) and $148.99 million (16.0%), respectively, while SHV holds $126.02 million (13.5%). FOBXX and ULTRA contribute $86.87 million (9.3%) and $21.21 million (2.3%), respectively. About $10.40 million (1.1%) is held in cash to support liquidity.

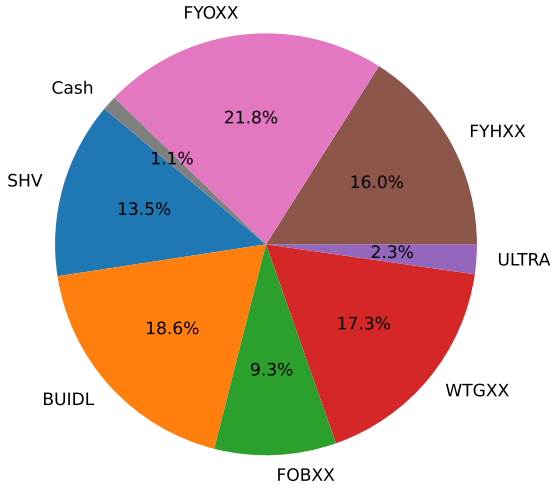


Figure D.1: OUSG – Average Holdings. The figure shows the average holdings of OUSG. The sample ranges from 15-02-2023 to 17-09-2025.

Figure D.2 depicts the evolution of OUSG's holdings over time, showing a transition

from a concentrated position in SHV through early 2024 to a more diversified allocation led by BUIDL. From mid-2024 onward, additional positions in BENJI, WTGXX, FYHXX, and ULTRA further reduced reliance on BUIDL. However, the continued presence of other TMMFs, such as BUIDL, within OUSG's portfolio increases interconnectedness among funds, potentially heightening systemic risk during periods of market stress through contagion effects or liquidity mismatches.

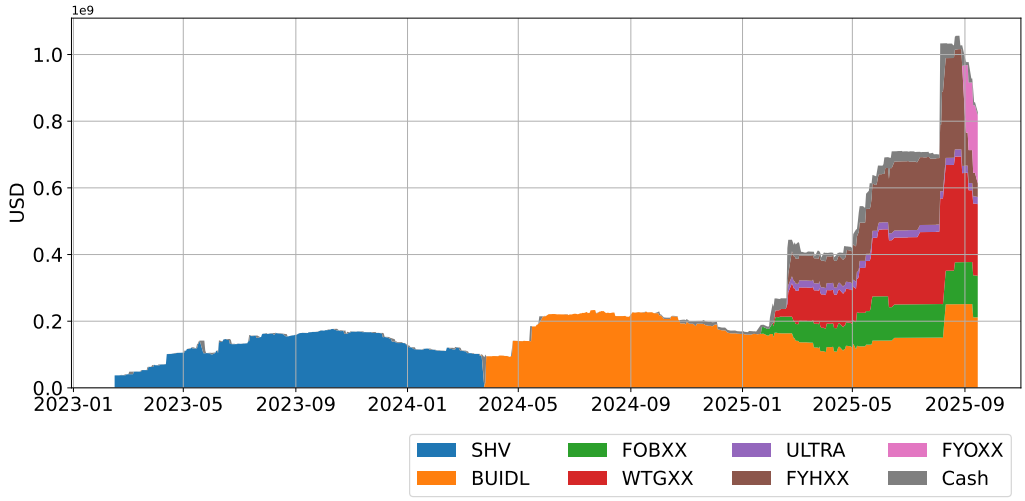


Figure D.2: OUSG – Holdings over Time. The figure shows the holdings of OUSG over time. The sample ranges from 15-02-2023 to 17-09-2025.

The supply of OUSG tokens is actively managed through a controlled minting and redemption process. Minting occurs when authorized participants deposit U.S. dollars or USDC into the fund. These contributions are then used to purchase short-term U.S. Treasury securities, forming the basis of the fund's asset holdings. Based on the current NAV and prevailing token price, the fund issues a corresponding number of new OUSG tokens to the participant. This process increases the token supply whenever new capital flows into the fund.

Conversely, redemption allows eligible OUSG token holders to exchange their tokens for a proportional share of the underlying Treasury assets or equivalent cash value. When such redemptions occur, the returned tokens are permanently burned, reducing the circulating supply. This redemption mechanism plays a critical role in maintaining price stability by ensuring the market price of OUSG tokens closely aligns with their NAV.

For OUSG, yield is compounded directly into the token's price, meaning the price gradually increases over time. More specifically, the price of an OUSG token is calculated as the AUM divided by the total token count (supply), reflecting the accumulating value of the underlying assets.

(a) OUSG - Token Price

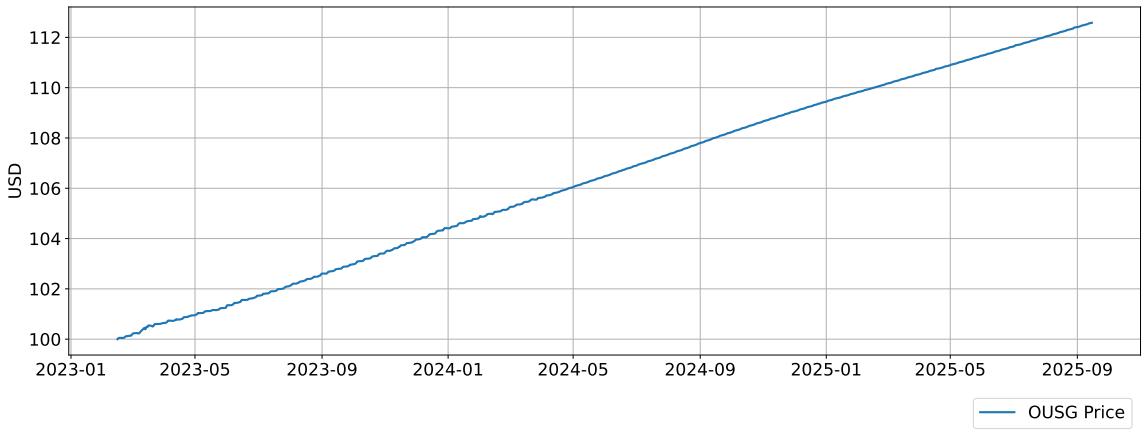


Figure D.3: OUSG – Token Price over Time. Figure shows the OUSG token price in USD. The sample ranges from 15-02-2023 to 17-09-2025.

D.2 BENJI

The Franklin OnChain U.S. Government Money Fund (FOBXX) constitutes the underlying investment product—a tokenized money market fund. BENJI, in contrast, is the digital asset token that represents beneficial ownership in the FOBXX fund on a

blockchain. Functionally, BENJI serves as the on-chain representation of the traditional security, enabling investors to custody, transact, and manage their fund shares through digital wallets and distributed ledger technology.

In Figure D.4, the average security type allocation for BENJI in percentage are presented. The portfolio is predominantly allocated to US Treasury repurchase agreements, which account for 54.6% of holdings. This is complemented by allocations to US Treasury debt (16.1%) and US government agency debt (15.5%). A smaller portion of the portfolio is held in cash, accounting for the remaining 13.8%.

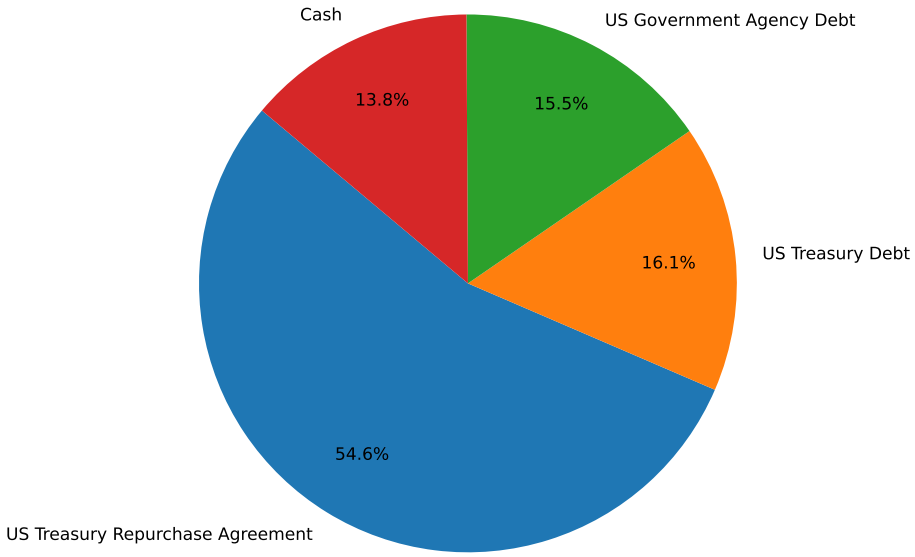


Figure D.4: BENJI – Average Holdings. The figure shows the average holdings of BENJI. The sample ranges from 15-02-2023 to 17-09-2025.