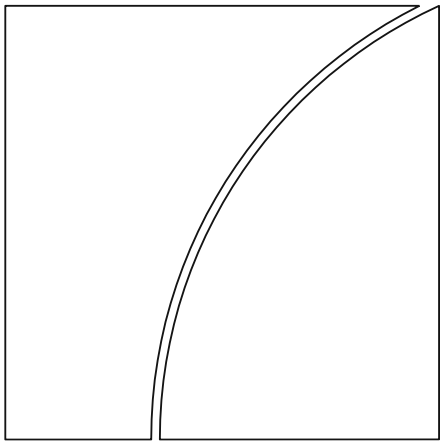


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by Rashad Ahmed and Iñaki Aldasoro

Monetary and Economic Department

October 2026

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Are stablecoins and bank deposits substitutes?*

Rashad Ahmed Iñaki Aldasoro

October 2026

Abstract

We test whether stablecoins and bank deposits act as substitutes by estimating the semi-elasticity of stablecoin market capitalization with respect to deposit rate changes. Using local projections fit to weekly U.S. data from January 2019 to June 2025, we find that deposit rate increases predict slower stablecoin growth. To address endogeneity, we exploit a nonlinearity in deposit rate pass-through. Whereas other money market rates track the federal funds rate roughly linearly, banks reprice deposits more aggressively once it exceeds approximately 3%. Against average ten-week stablecoin growth of 15%, ordinary least squares estimates imply a reduction of roughly 3 percentage points per basis point of deposit repricing, or about 2.4 percentage points per one-standard-deviation move. Instrumental variable estimates are roughly three times larger and pass a placebo test using non-stablecoin cryptocurrencies. Effects are stronger for USDC than for USDT, consistent with the former's closer ties to U.S. depositors. Cross-sectional variation in repricing across deposit tiers provides independent evidence of substitution. The size of the stablecoin sector therefore depends in part on how banks price deposits.

JEL classification: E42, E43, G21, G23.
Keywords: stablecoins, bank deposits, deposit rates, substitution, monetary policy.

*Ahmed is with the Andersen Institute for Finance and Economics (rashad.ahmed@andersen.com); Aldasoro is with the Bank for International Settlements (BIS) (corresponding author: inaki.aldasoro@bis.org). We thank Jon Frost, Stefan Jacewitz, Blake Marsh, Jordan Pandolfo, Padma Sharma and seminar participants at the Boston-NY Fed Conference on Stablecoins and Tokenization, the Federal Reserve Bank of Kansas City, the Monetary Authority of Singapore, and a thematic group meeting at the BIS for helpful comments and suggestions. References to individual firms and projects are for illustrative purposes and should not be construed as any statement on the soundness or the legal or regulatory status of any firm or project. The authors acknowledge the use of artificial intelligence in research assistance and editorial refinement. Responsibility for all errors remains with the authors. The views expressed here are those of the authors only and not necessarily those of the Andersen Institute or affiliated institutions, nor the BIS or its member central banks. First version: March 2026.

1 Introduction

Stablecoins and non-maturity bank deposits share fundamental features: they promise to offer price stability, are redeemable on demand, serve or aspire to serve as payment instruments, and issuers of both pay no or little interest directly to holders. This overlap has raised the concern that stablecoins could compete with deposits for funding, eroding banks' low-cost funding base and impairing credit intermediation. Recent work discusses this possibility (Liao and Caramichael, 2022; Coste, 2024; Cong, 2025; Wang, 2025; Ahmed and Aldasoro, 2026a; Altavilla et al., 2026). Much of this literature presupposes substitutability between stablecoins and deposits. Yet empirical evidence on whether stablecoins and deposits actually behave as substitutes remains scarce, and survey evidence yields mixed conclusions (Ahmed et al., 2025).

Answering this question is empirically challenging at the current stage of stablecoin adoption. The market has a relatively short history, available data provide limited information on the geographic distribution of stablecoin holdings, and stablecoins remain small relative to the U.S. banking system. These features make it difficult to directly estimate the effect of stablecoin adoption on aggregate bank deposit funding. We therefore ask a more fundamental question that can be studied with the data currently available: do stablecoin holdings respond to changes in the return on bank deposits?

This paper provides an empirical test of this substitution margin, motivated by the economic definition of substitution whereby demand for one asset responds to changes in the relative return on the other. If stablecoin demand responds to bank deposit rates, then stablecoins and deposits compete along a common portfolio margin, even if stablecoins are not yet large enough to generate readily detectable aggregate deposit outflows. Our approach therefore identifies the underlying substitution mechanism through which large-scale stablecoin adoption could eventually affect bank funding, while recognizing the limits of what the relatively young stablecoin market can currently reveal.

A simple portfolio choice model in which stablecoins and deposits provide overlapping convenience services rationalizes two intuitions: deposit rate increases should reduce stablecoin holdings conditional on market rates, and this substitution effect should be stronger at higher deposit rates. We use weekly U.S. data for January 2019–June 2025 to estimate local projections (Jordà, 2005) of logged stablecoin market capitalization on deposit rate changes, controlling for the federal funds rate, Treasury rates, the U.S. dollar index, bitcoin prices, and the Chicago Board Options Exchange Volatility Index (VIX). These controls absorb the opportunity cost of holding non-interest-bearing assets, exchange rate movements, crypto market conditions, and broader financial volatility.

Even with a rich set of controls for potential confounders, reverse causality remains a key source of endogeneity. If stablecoin growth draws funds from banks and banks respond by raising deposit rates to retain funding, this feedback biases OLS estimates upward toward zero, attenuating the negative substitution effect. To address endogeneity, we exploit a nonlinearity in deposit rate pass-through. Below approximately 3%, deposit rates barely respond to federal funds rate changes; above this threshold, they adjust more aggressively as competitive pressure on banks intensifies. This state-dependent pass-through in the form of nonlinear *deposit betas* is well documented and became particularly salient during the most recent monetary tightening cycle (Drechsler et al., 2023; Greenwald et al., 2023; Kang-Landsberg et al., 2023; Emin et al., 2025). Crucially, the kink is specific to deposit rates; Treasury bill rates adjust linearly across all rate levels.

We present three sets of results. First, OLS estimates with controls show that deposit rate increases predict slower stablecoin market capitalization growth. Second, instrumenting with the nonlinear deposit rate kink using an instrumental variable (IV) strategy amplifies the estimates roughly threefold, consistent with attenuation bias and the instrument concentrating identification in the high-rate period where substitution incentives are strongest. Against unconditional average ten-week stablecoin growth of 15%, OLS estimates imply a growth reduction of roughly 3 percentage points per basis point of deposit repricing. A crypto market placebo test confirms that the IV does not predict non-stablecoin crypto market cap growth, ruling out potentially confounding broad crypto cycles. When disaggregated by stablecoin, the effect is stronger for Circle's USDC than for Tether's USDT, consistent with USDC's closer ties to U.S. institutional users. Third, cross-sectional variation in repricing across deposit tiers provides independent supporting evidence of substitution. The results are robust to excluding the Silicon Valley Bank episode, controlling for institutional crypto events, including a time trend, controlling for stablecoin DeFi yields, controlling for cryptocurrency trading volume, varying the kink threshold, and replacing bank non-maturity deposit rates with bank certificate of deposits (CD) rates. Additional analysis shows that the negative relationship with deposit rates is also present among stablecoins supplied to DeFi lending protocols, even after controlling for DeFi yields.

We contribute to the literature studying how new forms of money interact with existing ones. Demand for money-like claims responds to relative returns, and the composition of those claims shifts with the interest rate environment. The price of the liquidity services embedded in near-money assets rises with the level of short-term rates (Nagel, 2016), so the margin between competing claims is state-dependent. Investors reallocate between bank deposits and money market funds as deposit spreads widen and narrow over the policy cycle (Drechsler et al., 2017; Xiao, 2020), and the

outstanding stock of privately issued money-like claims adjusts to the state of money demand (Sunderam, 2015). We show that stablecoins belong to this class of claims, despite being issued outside both the banking and the regulated fund sectors.

More concretely, we contribute to work on stablecoin-bank interactions (Liao and Caramichael, 2022; Coste, 2024; Carapella, 2025; Nigrinis, 2025; Wang, 2025; Cong, 2025; Jacewitz, 2025; Ahmed and Aldasoro, 2026a; Altavilla et al., 2026; Huang and Keister, 2026) by providing, to our knowledge, the first empirical evidence that deposit rate changes affect stablecoin flows. Our results identify the underlying substitution margin through which the bank funding effects emphasized in much of this literature could operate, without requiring stablecoins already to be large enough to generate measurable aggregate deposit outflows. Ahmed and Aldasoro (2026b) document that stablecoin inflows compress short-term Treasury yields, suggesting that stablecoins interact with traditional financial markets through multiple channels. An earlier, largely theoretical literature studies the interaction between central bank digital currencies (CBDCs) and the banking system, including their potential to displace bank deposits and affect bank funding and credit intermediation (Andolfatto, 2021; Ahnert et al., 2022; Chiu et al., 2023; Keister and Sanches, 2023). In that setting, the substitutability between CBDCs and deposits is more readily apparent. Yet limited large-scale CBDC adoption has made the underlying substitution mechanism difficult to study empirically. Our setting provides empirical evidence on a closely related mechanism using an already widely circulating form of digital money.

2 A simple model of substitution

Consider an agent who allocates wealth W across three assets: stablecoins (S, yield zero, crypto convenience), non-maturity deposits (D, yield r^d, payment convenience), and Treasury bills (B, yield r^m, no convenience). The agent maximizes

$$\max_{S,D,B} \quad r^d D + r^m B + V(S, D), \qquad \text{s.t.} \quad S + D + B = W, \tag{1}$$

where $V(S, D)$ captures the convenience yield from holding money-like assets. We assume V is strictly concave in (S, D) with $V_S, V_D > 0$.

The key modeling choice is $V_{SD} < 0$: an increase in deposits reduces the marginal convenience value of stablecoins. This captures the idea that both instruments serve partially overlapping functions (payments, liquidity, store of value). We refer to $V_{SD} < 0$ as *substitutability*. An alternative view, where stablecoins serve primarily crypto-ecosystem functions (decentralized finance (DeFi) collateral, exchange settlement) rather than deposit-like functions, would imply $V_{SD} \approx 0$ or even $V_{SD} > 0$. The sign is ultimately an empirical question.

We further assume that own effects dominate cross effects:

$$|V_{SS}| > |V_{SD}| \quad \text{and} \quad |V_{DD}| > |V_{SD}|. \tag{2}$$

That is, an additional dollar of either asset changes its own marginal convenience value by more than it changes that of the other. The condition restricts the magnitude of V_{SD}, not its sign, and is stronger than strict concavity, which ensures only that at least one of the two inequalities holds. Prediction 1 below does not depend on it, but Prediction 2 does.

Assuming an interior solution, the first-order conditions are $V_S = r^m$ and $V_D + r^d = r^m$. Totally differentiating and solving by Cramer's rule, with $\Delta \equiv V_{SS}V_{DD} - V_{SD}^2 > 0$:

Prediction 1 (Substitution). $\partial S/\partial r^d|_{r^m} = V_{SD}/\Delta < 0$. An increase in the deposit rate, holding the market rate fixed, reduces stablecoin holdings.

Prediction 2 (Opportunity cost). Under Condition (2), $\partial S/\partial r^m|_{r^d} = (V_{DD} - V_{SD})/\Delta < 0$. An increase in the market rate reduces stablecoin holdings through the opportunity cost channel, absorbed by the regression controls (see Appendix A).

Prediction 3 (State-dependent substitution). A heterogeneous-agent extension (Appendix A) shows that the aggregate substitution effect is stronger when deposit rates are higher: as the deposit rate rises, the switching threshold moves into a region where more agents are on the margin, so the same basis point increase causes more substitution. This rationalizes the OLS-to-IV amplification.

The importance of conditioning on r^m. Prediction 1 and Prediction 2 describe two distinct channels through which changes in deposit rates can affect stablecoin holdings. Total changes in stablecoin holdings with respect to deposit rates can be decomposed as:

$$\frac{dS}{dr^d} = \underbrace{\left.\frac{\partial S}{\partial r^d}\right|_{r^m}}_{\text{substitution } (<0)} + \underbrace{\left.\frac{\partial S}{\partial r^m}\right|_{r^d} \cdot \frac{dr^m}{dr^d}}_{\text{opportunity cost } (<0)}. \tag{3}$$

The first term corresponds to Prediction 1 and captures the substitution effect holding market rates fixed: an increase in deposit rates makes deposits relatively more attractive than stablecoins and reduces stablecoin demand. The second term corresponds to Prediction 2 and captures the broader opportunity-cost channel. Since deposit rates generally increase with market rates, higher deposit rates may also coincide with higher returns available on alternative interest-bearing assets such as Treasury bills. Under Condition (2), both channels therefore predict lower stablecoin holdings.

Because deposit rates tend to lie below market rates and are themselves a func-

tion of market rates, failing to condition on r^m would combine these two effects.[1] The empirical specification therefore controls for movements in market rates (through changes in the federal funds rate and Treasury yields) to isolate variation in deposit rates that is orthogonal to broader interest-rate conditions and thereby more closely identify the substitution effect between deposits and stablecoins.

Allowing yield on stablecoins. Allowing stablecoins to pay a yield r^s adds $r^s S$ to the objective function given by Equation (1), so the first-order conditions become $V_S = r^m - r^s$ and $V_D = r^m - r^d$.[2] The substitution effect of an *independent* deposit rate change is nonetheless unchanged, $\partial S/\partial r^d|_{r^m,r^s} = V_{SD}/\Delta < 0$. That is, it remains governed by overlapping convenience and not by whether stablecoins are remunerated.

When yields move with market rates, $dr^s = \beta^s dr^m$ and $dr^d = \beta^d dr^m$, we have

$$\frac{dS}{dr^m} = \frac{(1-\beta^s)V_{DD} - (1-\beta^d)V_{SD}}{\Delta}, \tag{4}$$

which is positive if and only if $1-\beta^s < \kappa(1-\beta^d)$, where $\kappa \equiv V_{SD}/V_{DD} \in (0,1)$ under Condition (2). A stablecoin yield beta above the deposit beta is thus necessary but not sufficient for market rate increases to raise stablecoin holdings, because stablecoins also compete with bills. Even when $\beta^s > \beta^d$, a rate increase raises the opportunity cost of holding stablecoins relative to bills unless $\beta^s = 1$. The condition holds for any $\beta^d < 1$ once β^s is sufficiently close to one, that is, once issuers pass through nearly all of their reserve income.[3] In practice, banks would likely respond by raising deposit betas, so effects may appear in both deposit pricing and flows. Because the substitution effect has the same form with or without remuneration, our estimates speak to how effective such repricing is in retaining funds.

3 Data

We assemble a weekly dataset covering January 2019 through June 2025 (339 observations).[4]

[1] Prediction 1 requires only $V_{SD} < 0$ and $\Delta > 0$. If Condition (2) failed, the opportunity cost channel could raise rather than lower stablecoin holdings, so the bias from failing to condition on r^m would be of ambiguous sign. This reinforces the case for controlling for market rates.

[2] While stablecoin issuers generally do not remunerate holders directly, holders can earn yield by supplying stablecoins to DeFi protocols or by holding them on exchanges and platforms that offer 'rewards' on stablecoin balances. Our robustness exercises with stablecoin balances in DeFi and DeFi yields provide an approximate empirical counterpart to this comparative static (Online Appendices OA.E and OA.F).

[3] At $\beta^s = 1$, stablecoins dominate bills because they offer the same yield but with added convenience, the agent's bill holdings go to zero, and the condition reduces to $\beta^s > \beta^d$.

[4] The sample starts in January 2019, when stablecoin market capitalization first exceeded $1 billion on a sustained basis. Earlier observations (2017–2018) contain negligible stablecoin market cap and

Our outcome variable is log aggregate reserve-backed stablecoin market capitalization from CoinMarketCap, comprising USDT, USDC, and other reserve-backed tokens.[5] The key regressor is the weekly change in the national non-maturity deposit rate, ΔDR_t, constructed as the simple average of six national-level deposit rate series from RateWatch (accessed via Haver Analytics):[6] savings deposits (balance of $2,000 or more), preferred money market deposit accounts (MMDA) with balances of $25,000 and $10,000, and standard MMDA with balances of $2,000, $10,000, and $25,000. National rates on CDs are also sourced from RateWatch.

Control variables include the midpoint of the lower and upper federal funds rate targets, the 3-month Treasury bill rate, the 10-year Treasury yield (all from FRED), bitcoin prices (from Coinbase), the CBOE VIX index, and the nominal broad trade-weighted U.S. dollar index. The 10-year yield, bitcoin prices, and the VIX index control for crypto and financial market conditions along with the broader investment opportunity set available to stablecoin holders. The dollar index controls for exchange rate movements that may independently affect demand for dollar-denominated stablecoins, particularly for foreign holders. In addition, we collect data on the aggregate market capitalization of cryptocurrencies and aggregate cryptocurrency exchange trading volume, both sourced from CoinGecko. We also collect data on stablecoin yields offered on decentralized finance (DeFi) platforms using the stablecoin DeFi yield index published by DeFiRateIndex.com. The index is an equal-weighted average of stablecoin DeFi yields offered on Dai/USDS and USDC stablecoins across the major lending protocols Aave and Compound. We also collect data on aggregate balances of USDT and USDC supplied to DeFi lending protocols, sourced from DeFiLlama.

Figure 1 plots the data. Stablecoin market capitalization grew from under $5 billion in 2019 to over $220 billion by mid-2025, dominated by USDT and USDC (left panel). The right panel shows interest rates alongside the individual deposit rate series. The T-bill rate tracks the federal funds rate nearly one-for-one; pass-through to deposit rates is incomplete, consistent with deposit rate stickiness (Drechsler et al., 2017).[7]

contribute no useful identifying variation.

[5]The "other" category includes reserve-backed stablecoins TUSD, BUSD, FDUSD, PYUSD, and RLUSD. Algorithmic stablecoins (e.g., TerraUSD (UST) prior to its collapse) are excluded. For reserve-backed stablecoins trading at par, market capitalization closely tracks total tokens outstanding.

[6]Haver Analytics suspended its publication of deposit rate data in June 2025 to review methodological changes in RateWatch's national deposit rate calculations, thereby marking the end of our dataset.

[7]On average, only 6-8% of federal funds rate changes are passed on to demand deposits (Emin et al., 2025), and bank surveys report that 10-15% is passed through to savings deposit rates (OCC Interest Rate Risk Statistics Report (Fall 2025)).

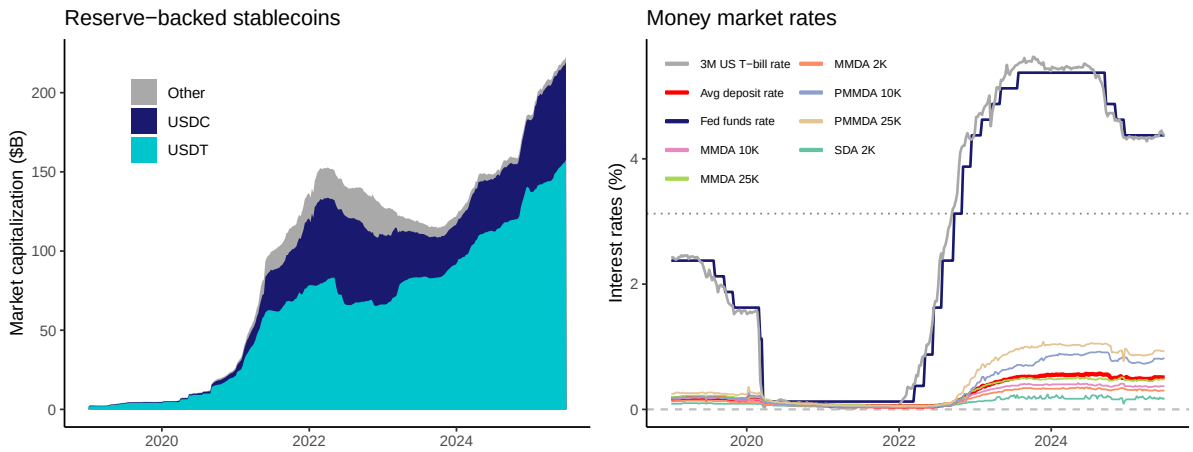


Figure 1: Left: reserve-backed stablecoin market capitalization by issuer (USDT, USDC, and other). Right: federal funds rate, 3-month T-bill rate, average non-maturity deposit rate (red line), and individual deposit rates by tier. Sample: January 2019 – June 2025. The dotted horizontal line indicates a federal funds target rate midpoint of 3.125%.

Table 1: Summary statistics (January 2019 – June 2025)

Variable	T	Mean	St. Dev.	Min	Max
Stablecoin market cap ($B)	339	95.42	66.69	2.40	222.71
Federal funds rate (%)	339	2.60	2.11	0.12	5.38
Deposit rate (%)	339	0.26	0.20	0.05	0.57
Δ Deposit rate (bp)	338	0.10	0.81	−3.50	3.50
US 3-month T-bill rate (%)	339	2.64	2.16	0.01	5.63
US 10-year Treasury yield (%)	339	2.74	1.34	0.55	4.93
Bitcoin price ($)	339	36,420	27,465	3,438	107,794
VIX index (%)	339	20.22	7.73	11.93	66.04
US dollar index	339	112.09	5.12	101.59	124.58
Crypto market cap ($B)	339	1,407	1,008	111	3,774

4 Empirical strategy

4.1 Local projection specification

We estimate local projections of the form:

$$\ln SC_{t+h} - \ln SC_{t-1} = \alpha_h + \beta_h \, \Delta DR_t + \sum_{l=1}^{4} \delta_{h,l} \Delta DR_{t-l} + \sum_{l=0}^{4} \gamma_{h,l} \mathbf{X}_{t-l} + \sum_{l=1}^{4} \omega_{h,l} \Delta \ln SC_{t-l} + e_{t+h}, \tag{5}$$

where $\ln SC_{t+h}$ is logarithm of stablecoin market capitalization for horizons $h = 0, 1, \ldots, 10$ weeks. The treatment variable is the contemporaneous change in the non-maturity deposit rate, $\Delta DR_t = DR_t - DR_{t-1}$. Lags one through four of ΔDR_t absorb persistence in deposit rate dynamics.[8] The vector $\mathbf{X}_t$ contains first differences of the federal funds rate, the 3-month T-bill rate, the 10-year Treasury yield, the log bitcoin price, the log U.S. dollar index, and the VIX. The response is normalized to a 1 basis point deposit rate change (approximately 1.2 standard deviations of ΔDR_t). Standard errors use the Newey and West (1987) estimator with bandwidth h.[9] The full sample yields 324 effective observations at $h = 10$ after accounting for leads and lags. Online Appendix OA.A reports coefficient estimates at selected horizons.

4.2 Identification

The OLS estimate of β_h may not admit a causal interpretation. A key concern is reverse causality: if stablecoin growth draws funds from banks and banks respond by raising deposit rates, this generates a positive bias that works *against* finding a negative substitution effect. The OLS estimates may therefore understate the true effect. We adopt an IV strategy that exploits the nonlinear pass-through of the federal funds rate to deposit rates, that we argue arises out of banking sector-specific factors.

The deposit rate pass-through kink. As documented in Figure 2, the pass-through from the federal funds rate to deposit rates is strongly state-dependent. Below approximately 3%, banks pass through very little of any rate change. Above this threshold, pass-through increases sharply as depositors' outside options become salient, intensifying competitive pressure among banks (Drechsler et al., 2017). As such, the pass-through of interest rates to deposit rates tends to increase with the level of inter-

[8] The controls $\mathbf{X}_t$ enter at lags 0 through 4 because these variables are determined in financial markets and can affect stablecoin holdings contemporaneously. The deposit rate change, by contrast, enters with its own contemporaneous value and four additional lags because deposit repricing is sluggish and its effects may unfold over several weeks.

[9] At horizon h, the overlapping dependent variable induces a moving average of order h (MA(h)) structure in the residuals, making bandwidth h appropriate (Plagborg-Møller and Wolf, 2021). At $h = 0$ (no overlap), this reduces to heteroskedasticity-robust standard errors.

est rates (Drechsler et al., 2023; Greenwald et al., 2023; Emin et al., 2025). By contrast, the pass-through to the T-bill rate is approximately linear across all rate levels (Figure 2, right panel). The nonlinearity is specific to deposit markets.

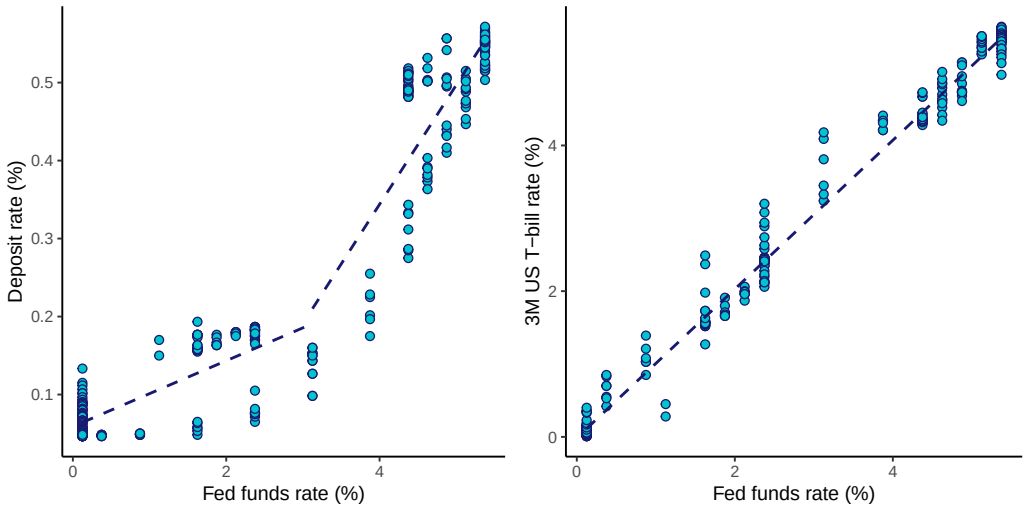


Figure 2: The federal funds rate vs. deposit rates (left) and T-bill rates (right). Dashed lines show piecewise OLS fits above and below a federal funds rate of 3.125%. Sample: January 2019 – June 2025.

First-stage specification. We formalize the nonlinearity through a first-stage regression:

$$\Delta DR_t = a_1 + a_2\,\mathbf{1}_{[FFR_{t-4}\geq 3.125\%]} + \sum_{l=0}^{4} B_l\,\Delta FFR_{t-l} + \sum_{l=0}^{4} C_l\,\Delta FFR_{t-l}\times\mathbf{1}_{[FFR_{t-4}\geq 3.125\%]} + \varepsilon_t, \tag{6}$$

where the interaction terms allows the pass-through of the federal funds rate to deposit rates to differ across regimes. The regime indicator uses the four-week lagged federal funds rate to reflect the delay in deposit repricing decisions. The threshold of 3.125% corresponds to the midpoint of the 3.00–3.25% Federal Open Market Committee (FOMC) target range; Online Appendix OA.J shows robustness to alternative thresholds. The first-stage F-statistic is 9.78 with an adjusted R^2 of 0.22. In the second stage, we replace the contemporaneous deposit rate change with its first-stage fitted value; lags ΔDR_{t-1} through ΔDR_{t-4} enter as predetermined controls.

The main threat to the exclusion restriction is that the high-rate period coincides with a distinct phase of the economic and crypto market cycles, so the kink-specific variation may capture factors other than deposit repricing. The controls for bitcoin prices, the U.S. dollar index, the VIX, and Treasury rates absorb the major channels through which the rate environment affects crypto markets independently of deposit substitution. The placebo test using non-stablecoin cryptocurrency market cap (be-

low) provides a direct check on whether the instrument predicts broad crypto market growth. We also control for cryptocurrency trading volume in additional robustness checks.

Crypto market placebo test. We assess the concern of a concurrent crypto cycle within the high interest rate regime directly with a placebo replacing the stablecoin outcome with changes in aggregate cryptocurrency market cap (excluding reserve-backed stablecoin market cap), denoted MC_t:

$$\ln MC_{t+h} - \ln MC_{t-1} = \alpha_h + \beta_h \Delta DR_t + \sum_{l=1}^{4} \delta_{h,l} \Delta DR_{t-l} + \sum_{l=0}^{4} \gamma_{h,l} \mathbf{X}_{t-l} + \sum_{l=1}^{4} \omega_{h,l} \Delta \ln MC_{t-l} + e_{t+h}, \tag{7}$$

where $\mathbf{X}_{t-l}$ includes the same controls as equation (5) except for bitcoin price changes, which is positively correlated with changes in cryptocurrency market cap.[10] If deposit rates affect stablecoins through substitution, they should not predict broad cryptocurrency growth, which due to its volatile nature carries no money-like convenience yield. An indirect channel exists, however, if stablecoin outflows reduce crypto-market liquidity, but this would predict *negative* crypto market growth, whereas a confound from the rate cycle would predict positive returns.

Cross-sectional variation. As an independent test, we exploit differential repricing across deposit tiers. When banks raise preferred MMDA rates (≥$25,000) more than savings deposit rates (≥$2,000), the resulting spread captures competitive deposit pricing orthogonal to aggregate rate movements. We replace deposit rate changes (ΔDR_{t-l}, for $l = 0, ..., 4$) in Equation (5) with changes in the deposit rate spread between preferred MMDA (≥$25,000) and savings (≥$2,000). The regression still controls for federal funds rate and Treasury yield changes, which absorb the correlation arising from differential deposit betas across tiers.

5 Results

5.1 Full-sample estimates

Figure 3 presents the full-sample results. The OLS estimates (left panel) show a statistically significant negative response: a 1 basis point deposit rate increase reduces

[10] Excluding bitcoin from the control set makes the test relatively conservative. Results of the placebo test do not materially change when including controls for bitcoin price changes, or when using bitcoin price changes as the outcome.

ten-week stablecoin market capitalization growth by roughly 3 percentage points, from an unconditional average of about 15% to about 12%.

After instrumenting (center panel), the estimated reduction in ten-week growth is roughly 9 percentage points per basis point, implying that growth slows from 15% to about 6%. The amplification relative to OLS is consistent with attenuation bias in weekly deposit rate changes and the instrument concentrating identification in the high-rate period where substitution incentives are strongest (Prediction 3).

The right panel reports the crypto market placebo. The IV does not predict statistically significant crypto market growth, with the 95% confidence band spanning zero throughout the horizon. This rules out the concern that the instrument captures variation correlated with the broad crypto cycle rather than the deposit-stablecoin substitution channel.

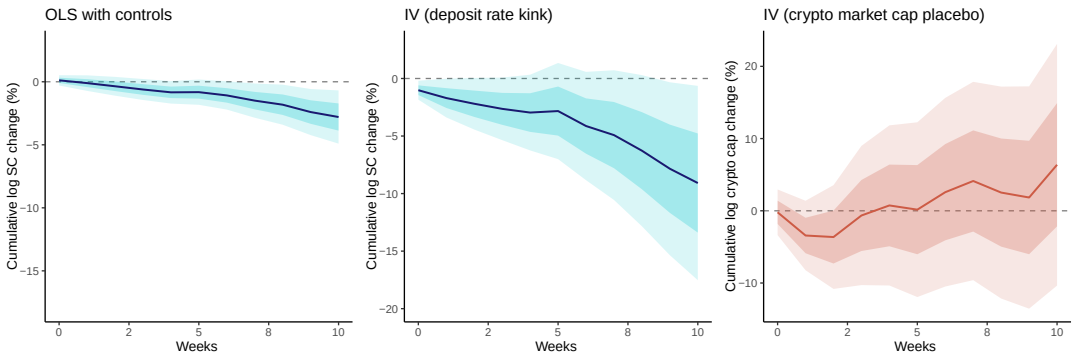


Figure 3: Full-sample results. Cumulative response to a 1 basis point deposit rate increase. Left: OLS with controls. Center: IV using the deposit rate kink. Right: crypto market placebo for the IV specification. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

Figure OA.H.1 reports the same IRFs but over a longer horizon of 28 weeks.

5.2 Cross-sectional evidence and disaggregation

Figure 4 presents the OLS specification using the cross-sectional spread instead of the average deposit rate. When preferred MMDA rates rise relative to savings deposit rates, stablecoin market capitalization declines (roughly -0.7% at $h = 10$). The crypto market placebo is statistically insignificant. The magnitudes are much smaller than the IV estimates because the spread captures only the cross-sectional component of deposit repricing; the common rate movement is absorbed by the controls. The consistent negative sign across these independent sources of variation strengthens the case for substitution.

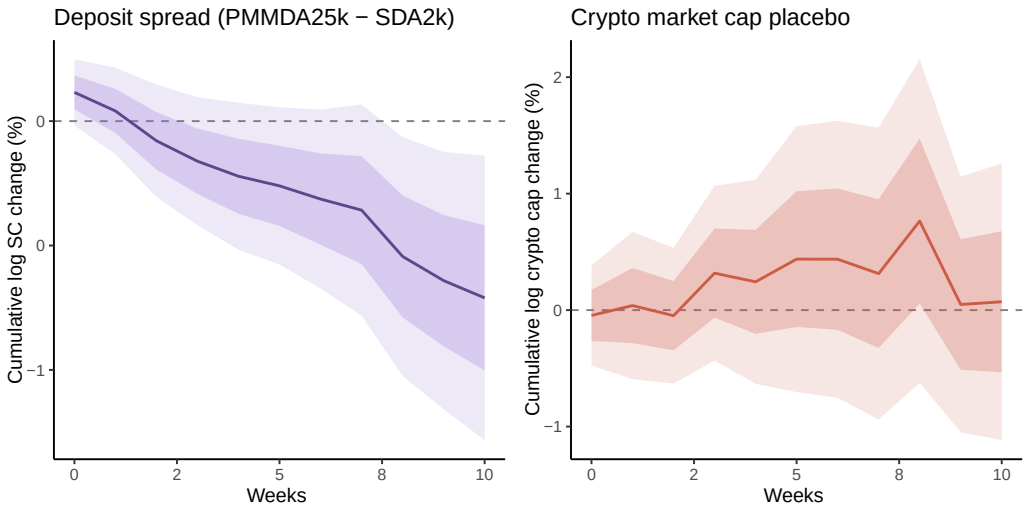


Figure 4: Cross-sectional results. Left: response to deposit rate spread (PMMDA25k − SDA2k). Right: crypto market placebo. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

We estimate the OLS specification separately for USDT and USDC. Figure 5 reports the results under OLS, IV, and deposit spread specifications. Across all specifications, the effect is driven by USDC (OLS estimate of roughly -5% at $h = 10$) rather than USDT (roughly -2% at $h = 10$). This is consistent with USDC's greater use among U.S. institutional and DeFi users, who are more likely to substitute between deposits and stablecoins. USDT, which is predominantly used in offshore activities or in developing economies, responds more weakly but still in the predicted direction.

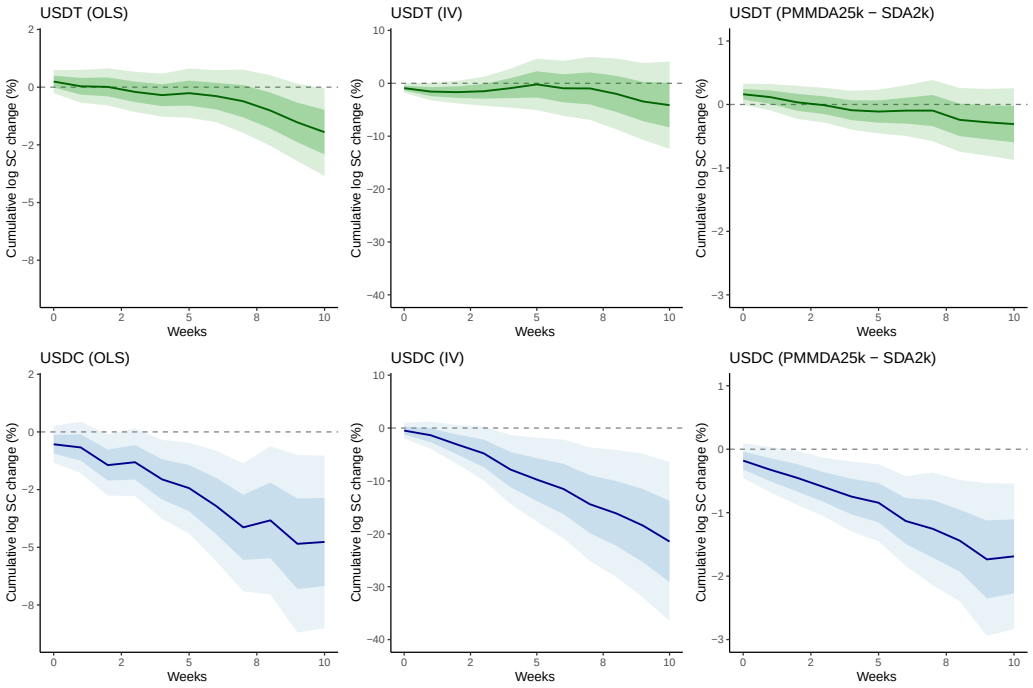


Figure 5: OLS, IV and deposit spread estimates by stablecoin. Top: Tether's USDT. Bottom: Circle's USDC. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

We split USDT and USDC balances into those supplied to DeFi lending protocols (and thereby earn yield) and balances outside lending protocols in Online Appendix OA.F. We find that the balances in lending protocols respond negatively to higher deposit rates, although the effects are imprecisely estimated. Balances outside lending protocols also decline, with a substantially larger response for USDC than for USDT, mirroring the issuer-level heterogeneity in Figure 5.

5.3 Magnitudes and caveats

The coefficients represent percentage point reductions in cumulative stablecoin market capitalization growth, not level declines. The average 10-week cumulative log change is 15%. The OLS estimate of roughly -3 percentage points per basis point implies that a 1 basis point deposit rate increase reduces ten-week growth from 15% to about 12%. The IV estimate of roughly -9 percentage points implies a reduction to about 6%. Growth slows but does not necessarily reverse. Figure 6 replots the OLS and IV estimates from Figure 3 against average cumulative growth at each horizon, illustrating that stablecoin market capitalization continues to grow after a deposit rate increase, but at a slower pace. To fully offset average ten-week growth under the OLS estimate would require approximately a 5 basis point one-week deposit rate increase, a 6-standard-deviation event. During the 2022–2023 tightening cycle, stablecoin mar-

ket capitalization did fall by roughly 30%, consistent with the gradual accumulation of deposit repricing effects alongside other adverse forces (Federal Reserve rate hikes, Terra collapse, FTX).

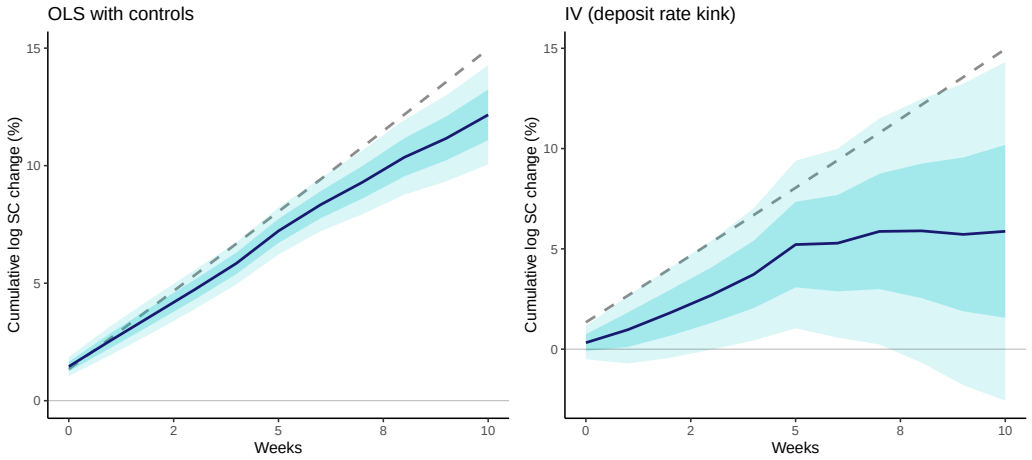


Figure 6: OLS (left) and IV (right) estimates plotted against average cumulative stablecoin growth (dashed line). The solid line and shaded bands show the implied growth path after a 1 basis point deposit rate increase. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

Several additional considerations bear on the interpretation. First, the first-stage F-statistic of 9.78 is close to but below the conventional Stock and Yogo (2005) threshold of 10, suggesting some instrument weakness. Second, our analysis uses aggregate data and speaks to asset demand rather than to bank balance sheets. We cannot identify which holders substitute, or which banks and deposit categories are affected. Because the funds are ultimately reinvested, a change in stablecoin balances can reallocate deposits across institutions and depositor types rather than change their aggregate level, depending on who the issuer's counterparties are. Third, the sample spans a single high-rate episode (2022–2025), a constraint imposed by data availability. Fourth, our estimates are obtained in a regime in which stablecoins pay no direct interest to holders. As discussed in Section 2, remuneration leaves the form of the substitution effect unchanged, but with sufficiently high pass-through of reserve income, market rate increases could raise rather than lower stablecoin holdings. Unsettled regulation on stablecoin yield, along with a small but growing segment of yield-bearing stablecoins and tokenized money market funds, makes this margin increasingly relevant. Fifth, our identification strategy captures the effect of deposit rate *changes*, not levels; the policy implications should be understood accordingly.

5.4 Robustness

Additional robustness checks are reported in the Online Appendix and summarized in Table 2. We focus in particular on several potential alternative explanations for our baseline results.

First, our estimates could reflect developments specific to cryptocurrency markets that are correlated with both stablecoin demand and interest rates, rather than substitution between stablecoins and bank deposits. We address this concern in several ways. We control for cryptocurrency trading volume, which captures broader variation in crypto-market activity (Online Appendix OA.B.1), and include indicators for major institutional crypto events, including the collapse of TerraUSD, the failure of FTX, and the phasing out of Binance's BUSD stablecoin (Online Appendix OA.C). We also separately account for the Silicon Valley Bank (SVB) episode, which had particularly important implications for USDC (Online Appendix OA.D). Across these exercises, the estimated responses remain similar to our baseline results.

Second, although stablecoins do not natively pay interest, holders can deploy them in decentralized finance (DeFi) protocols to earn a return.[11] This raises the possibility that the availability of DeFi yield complicates the interpretation of stablecoins as non-interest-bearing instruments. We address this concern by controlling directly for stablecoin DeFi yields (Online Appendix OA.E). We also obtain data on USDC and USDT balances supplied to DeFi lending protocols and separately estimate the response of balances inside and outside these protocols, while conditioning on changes in DeFi lending yields (Online Appendix OA.F). Only a relatively small share of either stablecoin is historically supplied to lending protocols. Moreover, even among balances deployed to earn lending yields, increases in deposit rates are associated with economically meaningful (though imprecisely estimated) declines for both USDC and USDT. Thus, we find little evidence that the ability to earn yield through DeFi insulates stablecoin holdings from competition with bank deposits.

Third, our baseline analysis focuses on non-maturity deposits, which provide a natural comparison for stablecoins given their liquidity. A concern, however, is that the estimated substitution effect is specific to this particular deposit product. We replace non-maturity deposit rates with rates on bank certificates of deposit (CDs), which typically offer higher yields and respond more strongly to monetary policy but are less liquid because of their contractual maturities (Online Appendix OA.G). Stablecoin balances again decline following increases in CD rates under both OLS and

[11] Alternatively, some exchanges and third-party platforms offer 'rewards' on stablecoin balances held with them, which resemble interest and are typically arranged with an issuer to be a share of reserve income. We do not control for these rewards directly, but to the extent that they track reserve income, their movements are largely absorbed by the market rate controls in our baseline specification. Rules around such forms of indirect interest on stablecoins remain unsettled.

IV, while non-stablecoin cryptocurrency market capitalization does not respond. The substitution relationship therefore extends beyond instruments of similarly high liquidity to less-liquid, but higher-yielding bank deposit products. This same liquidity-for-yield margin appears in our DeFi results, where changes deposit rates negatively affect stablecoin balances supplied to lending protocols, because these stablecoin balances earn higher yields but sacrifice some liquidity. The substitutability we document between stablecoins and CD rates carries particular relevance for community banks, given their disproportionate reliance on time-deposit funding (Laliberte et al., 2023).

Finally, we examine whether the results are sensitive to several choices in our empirical specification. We extend the horizon of the local projections to 28 weeks (Online Appendix OA.H), include a linear time trend (Online Appendix OA.I), and consider alternative threshold values for the deposit kink (Online Appendix OA.J). Our main conclusions are robust across these alternative specifications.

Table 2: Summary of local projection estimates under alternative specifications

Specification	OLS	IV	Section
Baseline ($h = 10$)	-2.8%	-9.1%	5
Crypto-market developments			
Crypto trading volume control	-3.0%	-9.0%	OA.B
Crypto event controls	-2.9%	-10.3%	OA.C
Exclude SVB episode	-2.4%	-6.5%	OA.D
DeFi yields and lending			
DeFi yield control	-2.6%	-6.9%	OA.E
USDT: in DeFi lending	-6.1%	—	OA.F
USDT: outside DeFi lending	-0.8%	—	OA.F
USDC: in DeFi lending	-3.4%	—	OA.F
USDC: outside DeFi lending	-5.5%	—	OA.F
Alternative deposit product			
Replace NMD rates with CD rates	-2.2%	-15.5%	OA.G
Alternative specifications			
Longer horizon ($h = 28$)	-4.9%	-13.6%	OA.H
Linear time trend	-2.5%	-4.0%	OA.I
Alternative IV thresholds	—	-8.4% to -10.7%	OA.J

Additional robustness checks, with details reported in the Online Appendix. Entries report the cumulative response of stablecoin market capitalization to a 1 basis point increase in the relevant deposit rate. Unless otherwise indicated, estimates are reported at $h = 10$ weeks. The DeFi lending decomposition reports issuer-specific OLS estimates that additionally control for changes in DeFi lending yields.

6 Conclusion

We present evidence consistent with stablecoins and bank deposits being substitutes. Deposit rate increases predict stablecoin outflows across OLS with controls, an IV strategy exploiting the nonlinear pass-through kink, and a cross-sectional specification using differential repricing across deposit tiers. The effect is stronger for USDC than for USDT, and is absent for non-stablecoin cryptocurrency market growth. The issuer split suggests that the margin against U.S. deposits is concentrated among onshore-linked holders, with demand for offshore-held stablecoins likely responding to different forces.

Our findings have implications for policy and regulation. For monetary policy, the pass-through of policy rates to deposit rates affects the allocation of funds between banks and stablecoin issuers. The set of claims competing with deposits now includes instruments issued outside both the banking and the regulated fund sectors. If stablecoins grow to be viewed as a form of digital cash, our results on substitution suggest that their adoption is sensitive to the terms banks offer depositors, and that banks retain some influence over the pace of that adoption through deposit pricing.

For stablecoin regulation, the substitution margin we document is itself shaped by regulatory design. This calls for, *inter alia*, assessing the pros and cons of requiring some proportion of stablecoin reserves to be held in deposits. Such a requirement would support liquidity management and limit any negative externality of stablecoin growth on bank funding, but at the cost of financial fragility arising from concentrating large uninsured deposits in a small number of banks.[12]

A second lever is whether issuers may remunerate holders. More generally, the boundary between forms of money moves with relative returns, not only with technology and access. We show that stablecoin balances respond to what banks pay depositors. How that boundary settles will depend on the returns each form of money is allowed to offer.

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[12] These issues are subject to active debate. Even if stablecoin growth reduces bank credit provision, the welfare assessment must weigh distributional effects, the gains from increased competition, and the extent to which non-banks can efficiently fill any credit gap.

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A Model details

A.1 Comparative statics derivations

Totally differentiating the first-order conditions $V_S = r^m$ and $V_D + r^d = r^m$:

$$\underbrace{\begin{pmatrix} V_{SS} & V_{SD} \\ V_{DS} & V_{DD} \end{pmatrix}}_{\equiv \mathbf{H}} \begin{pmatrix} dS \\ dD \end{pmatrix} = \begin{pmatrix} dr^m \\ dr^m - dr^d \end{pmatrix}. \tag{8}$$

Let $\Delta \equiv V_{SS}V_{DD} - V_{SD}^2 > 0$. Setting $dr^m = 0$:

$$\left.\frac{\partial S}{\partial r^d}\right|_{r^m} = \frac{V_{SD}}{\Delta} < 0, \qquad \left.\frac{\partial D}{\partial r^d}\right|_{r^m} = -\frac{V_{SS}}{\Delta} > 0. \tag{9}$$

These signs follow from strict concavity and $V_{SD} < 0$ alone.

Setting $dr^d = 0$:

$$\left.\frac{\partial S}{\partial r^m}\right|_{r^d} = \frac{V_{DD} - V_{SD}}{\Delta} < 0, \qquad \left.\frac{\partial D}{\partial r^m}\right|_{r^d} = \frac{V_{SS} - V_{SD}}{\Delta} < 0. \tag{10}$$

The sign of the first expression requires $|V_{DD}| > |V_{SD}|$ for stablecoins to decline when the market rate rises. The sign of the last expression requires $|V_{SS}| > |V_{SD}|$ (own effects dominate cross effects) for deposits to decline when the market rate rises. Strict concavity alone guarantees only that at least one of these conditions holds, which is why we impose both in Condition (2).

The first expression combines two forces. A higher market rate raises the opportunity cost of holding stablecoins, a direct effect of $V_{DD}/\Delta < 0$. It also widens the deposit spread $r^m - r^d$, so deposits fall and, because $V_{SD} < 0$, the marginal convenience value of stablecoins rises, a spillover of $-V_{SD}/\Delta > 0$. Prediction 2 requires the direct effect to dominate. Since stronger substitutability strengthens the spillover, Prediction 2 does not follow from substitutability alone; it requires own effects to dominate cross effects.

As discussed in the main text, conditioning on r^m matters. The unconditional derivative confounds two channels:

$$\frac{dS}{dr^d} = \underbrace{\left.\frac{\partial S}{\partial r^d}\right|_{r^m}}_{\text{substitution } (<0)} + \underbrace{\left.\frac{\partial S}{\partial r^m}\right|_{r^d} \cdot \frac{dr^m}{dr^d}}_{\text{opportunity cost } (<0)}. \tag{11}$$

Under Condition (2), both terms are negative but reflect different channels. The regression controls for r^m (through ΔFFR, ΔT-bill, Δ10Y) shut down the second channel.

A.2 Parametric example

With a quadratic convenience function $V(S, D) = a_s S - \frac{b_s}{2} S^2 + a_d D - \frac{b_d}{2} D^2 - c\, SD$ where $c > 0$ governs substitutability, the comparative statics become $\partial S^* / \partial r^d = -c/(b_s b_d - c^2) < 0$ and $\partial S^* / \partial r^m = -(b_d - c)/(b_s b_d - c^2)$, where the sign of the latter requires $c < b_d$. The Condition (2) corresponds to $c < \min(b_s, b_d)$, which also implies strict concavity ($b_s b_d > c^2$).

A.3 Heterogeneous agents (Prediction 3)

Suppose agents indexed by $\theta \sim F(\theta)$ hold stablecoins if their idiosyncratic convenience exceeds a threshold $\theta^* = \phi + r^d$, where ϕ is the common deposit convenience yield. Aggregate stablecoin holdings are $S^{agg} = \bar{S}[1 - F(\theta^*)]$, so $\partial S^{agg} / \partial r^d = -\bar{S} f(\phi + r^d)$. The sensitivity of aggregate stablecoin holdings to the deposit rate thus depends on the density of agents at the switching threshold. When deposit rates are low, the threshold is low, and relatively few agents are near it. As deposit rates rise, the threshold moves into a region where more agents are clustered, so the same basis point increase causes more switching. Formally, this requires $f'(\theta^*) > 0$: the density of agents is increasing at the threshold. This rationalizes the OLS-to-IV amplification: the IV identifies the effect in the high-rate period where the density of marginal agents is greatest.

Online Appendix

OA.A Coefficient estimates

Table OA.A.1: Local projection coefficient estimates at selected horizons (% per basis point)

	Aggregate (OLS)	Aggregate (IV)	USDT (OLS)	USDC (OLS)	Spread (OLS)
$h = 0$	0.1	−1.0	0.2	−0.5	0.1
$h = 5$	−0.8	−2.8	−0.3	−2.4	−0.3
$h = 10$	−2.8	−9.1	−1.9	−4.8	−0.7
1st-stage F	—	9.78	—	—	—
N (at h=10)	324	324	324	324	324

OA.B Cryptocurrency trading volume

Non-stablecoin cryptocurrency trading activity may capture broader conditions in crypto markets that could influence stablecoin demand independently of deposit rates. In addition, because stablecoins are widely used as settlement and trading instruments within crypto markets, changes in cryptocurrency trading activity could potentially confound the estimated relationship between deposit rates and stablecoin balances. As an additional robustness check, Figure OA.B.1 reports estimates from specifications that augment the baseline regressions with a control for the log of aggregate 7-day average cryptocurrency exchange trading volume. The OLS and IV estimates remain very similar to the baseline results (at $h = 10$ weeks, -3 percent and -9 percent, respectively).

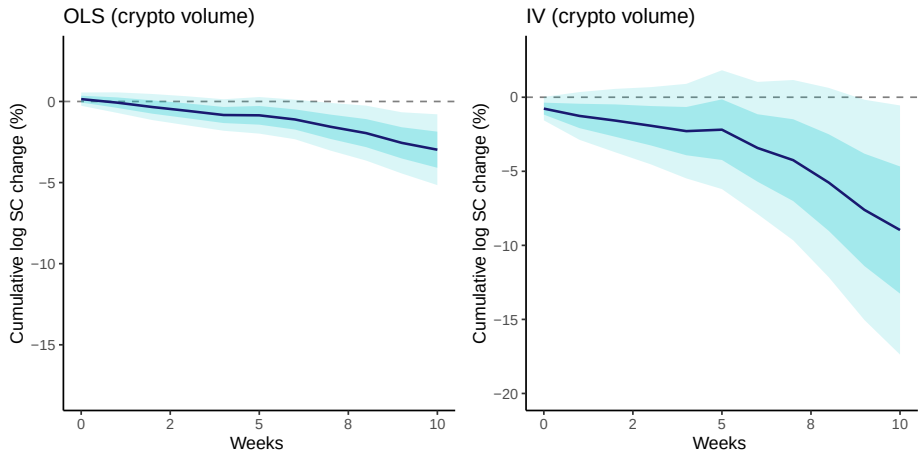


Figure OA.B.1: Full-sample OLS (left) and IV (right) controlling for log of the 7-day average aggregate cryptocurrency trading volume sourced from CoinGecko. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

OA.C Sensitivity to institutional crypto events

A number of major institutional developments in crypto markets could independently affect stablecoin demand and potentially confound the estimated elasticity. Figure OA.C.1 re-estimates the OLS and IV specifications on the full sample while including indicator variables for three major crypto events: the failure of FTX (November 11–December 2, 2022), the collapse of the algorithmic stablecoin TerraUSD (May 6–May 27, 2022), and the phaseout of Binance's BUSD stablecoin (February 10–March 3, 2023).[13] The estimated effects remain negative under both OLS and IV and are quantitatively similar to the baseline specification (at $h = 10$ weeks, -2.9 percent and -10.3 percent, respectively).

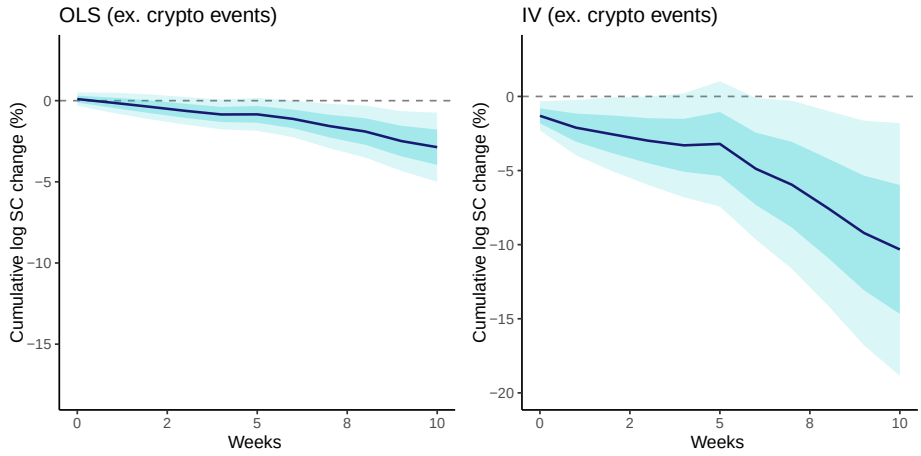


Figure OA.C.1: Full-sample OLS (left) and IV (right) including controls for three institutional crypto events: The failure of FTX, the collapse of the Terra USD stablecoin peg, and the phaseout of Binance's BUSD stablecoin. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

[13] In February 2023 the New York Department of Financial Services ordered Paxos to stop minting new BUSD tokens. At the time BUSD had a market capitalization of around $16 billion. Paxos continued meeting redemptions but no new minting took place, so supply declined steadily subsequently. This wind-down represents a relatively large mechanical decline in aggregate stablecoin market capitalization during the high-rate period that was unrelated to deposit substitution.

OA.D Sensitivity to the SVB episode

The Silicon Valley Bank (SVB) failure in March 2023 triggered a large USDC outflow unrelated to deposit rate substitution (Circle held reserves at SVB, and USDC briefly lost its peg). Figure OA.D.1 re-estimates the OLS and IV specifications on the full sample excluding April–May 2023. The point estimates remain negative under both OLS (roughly -2.4% at $h = 10$) and IV (roughly -6.5% at $h = 10$), confirming that the results are not driven by the SVB episode.

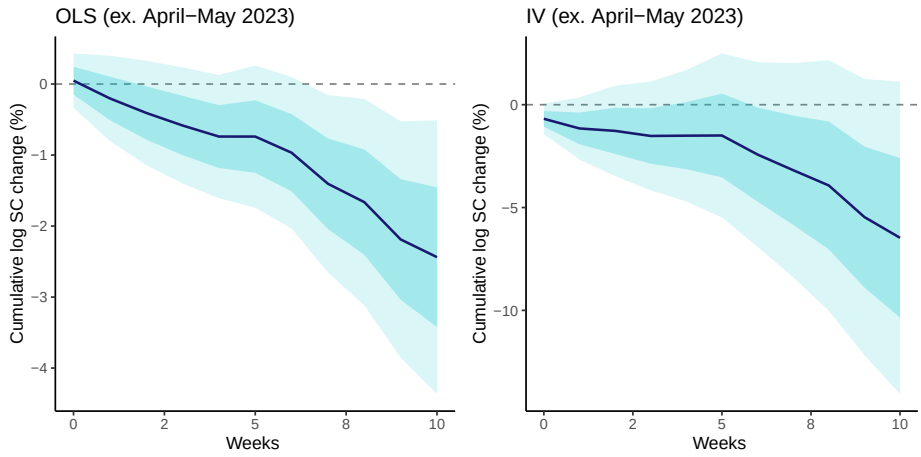


Figure OA.D.1: Full-sample OLS (left) and IV (right) excluding April–May 2023. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

OA.E DeFi yields

While stablecoins are typically non-interest bearing, holders can deploy them on third-party platforms to earn yield. These opportunities are primarily available through decentralized finance (DeFi) lending protocols and centralized crypto exchanges. Consequently, stablecoin yields may affect the relative attractiveness and opportunity cost of holding stablecoins versus bank deposits. To account for this channel, we augment the baseline specification with contemporaneous changes in stablecoin DeFi yields. We measure DeFi yields using the DeFi Yield Index published by DeFiRateIndex.com, which is constructed as an equal-weighted average of yields offered on the DAI/USDS and USDC stablecoins across the Aave and Compound lending protocols.[14]

Figure OA.E.1 reports estimates from specifications that augment the baseline regressions with a control for stablecoin DeFi yield changes. The OLS and IV estimates remain very similar to the baseline results (at $h = 10$ weeks, -2.6 percent and -6.9 percent, respectively).

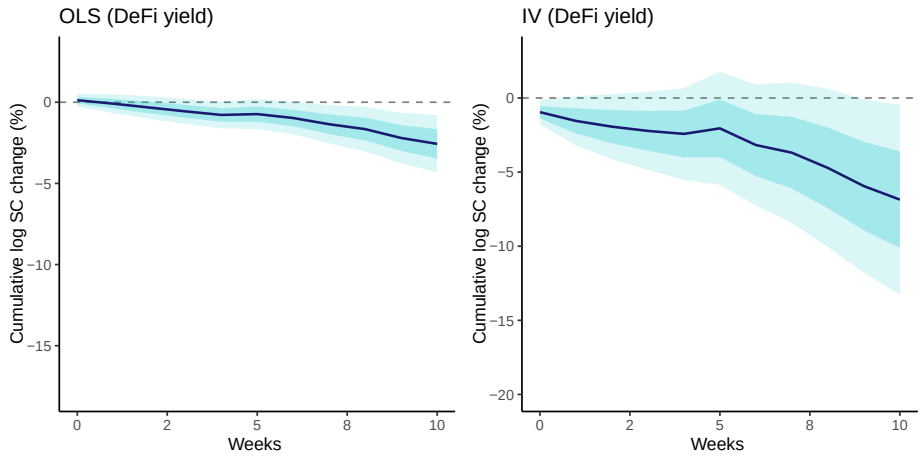


Figure OA.E.1: Full-sample OLS (left) and IV (right) controlling for changes in stablecoin DeFi yields. The yield index is constructed as the equal-weighted average of DeFi yields offered on Dai/USDS and USDC on Aave and Compound, respectively. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

[14]The DeFi Yield Index begins on December 18, 2020, and is therefore unavailable for the earlier portion of our sample. To preserve the full sample period, we include both an indicator variable equal to one when DeFi yield observations are available and zero otherwise, and the interaction of this indicator with changes in the DeFi Yield Index. This specification allows DeFi yields to affect stablecoin growth when observed while retaining pre-2021 observations used for identification.

OA.F Stablecoins supplied to lending protocols

A potential qualification to interpreting stablecoins as non-interest-bearing instruments is that holders can deploy them in decentralized finance (DeFi) protocols to earn a return. To examine whether this possibility affects the substitution between stablecoins and bank deposits, we obtain historical data on the quantities of USDC and USDT supplied to DeFi lending protocols from DeFiLlama. Only a relatively small share of stablecoin supply has historically been deployed to lending protocols: over their respective sample periods, the median shares of USDC and USDT are 12.8% and 4.1%. We use these data to decompose each stablecoin's outstanding supply into two components: stablecoins supplied to lending protocols and the residual supply held outside lending protocols.

Figure OA.F.1 reports several results. The left column plots the time-series of lending protocol balances for USDC and USDT. For each issuer, we then estimate the baseline local-projection specification separately using the log of lending-protocol balances and the log of outstanding supply excluding lending-protocol balances as dependent variables. Because the relevant comparison depends on the return available from deploying stablecoins in DeFi, these specifications additionally control for changes in DeFi lending yields. Thus, the estimated response to deposit rates can be interpreted as the response to an increase in bank deposit rates holding fixed movements in DeFi rates offered on stablecoins.

We report OLS estimates for this exercise rather than extending our IV specification. The lending protocol data are available over a substantially shorter period than the market capitalization series used in our baseline analysis, with the resulting samples concentrated in the recent monetary policy cycle and overlapping with several large disruptions in crypto and DeFi markets. This shorter window provides considerably less independent variation for the instrument used in our main analysis and makes the IV estimates particularly sensitive to events concentrated in the 2022-23 tightening cycle. We therefore treat the lending decomposition as a complementary descriptive exercise and retain the IV specification for the longer sample market capitalization analysis.

The results provide little evidence that stablecoins supplied to lending protocols are insulated from competition with bank deposits. For USDC, a 1 basis point increase in deposit rates is associated with a roughly 3.4 percent decline in lending protocol balances after ten weeks, although the estimate is imprecise. USDC supply outside lending protocols declines by approximately 5.5 percent over the same horizon and is estimated more precisely. For USDT, lending protocol balances decline by approximately 6.1 percent after ten weeks, whereas the estimated response of supply outside lending protocols is considerably smaller and statistically insignificant (-0.8 percent).

Although the relative responses differ across the two issuers, the lending protocol component responds negatively in both cases.

These results suggest that the ability to earn yield through DeFi does not eliminate the relationship between stablecoin demand and bank deposit rates. Indeed, even after conditioning on DeFi yields, balances actually supplied to yield-bearing lending protocols tend to decline following increases in deposit rates. This is consistent with the observation that DeFi-based stablecoin remuneration is largely disconnected from traditional money market rates (Barbon et al., 2025). As such, the relative-return mechanism underlying our baseline results continues to hold: an independent increase in bank deposit rates reduces the relative attractiveness of holding and deploying stablecoins, including for yield-generating purposes.

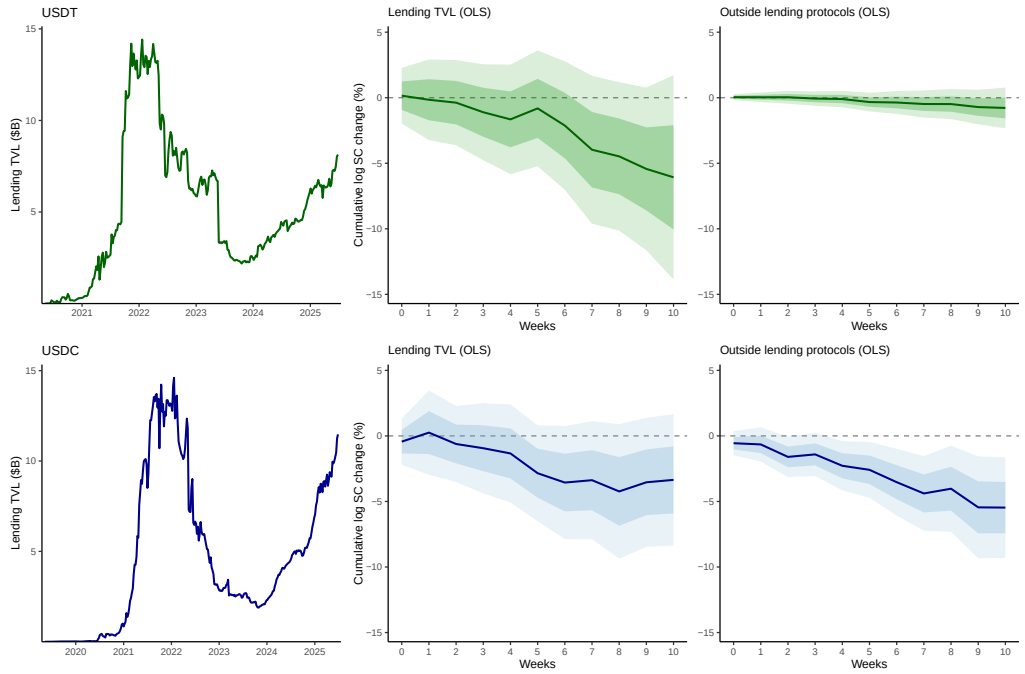


Figure OA.F.1: The first row is for Tether's USDT, the second is for Circle's USDC. The left panels plot the historical TVL of each stablecoin in DeFi lending protocols. The center panels plot the cumulative response of stablecoin lending protocol total value locked (TVL) to a 1 basis point deposit rate increase. The right panels plot the cumulative response of each stablecoin market capitalization excluding lending TVL. IRFs are OLS estimates, and control for DeFi yields. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

OA.G Replacing NMD rates with bank CD rates

As an additional robustness check, we investigate whether other types of bank deposit rates exhibit a similar relationship with stablecoin growth. To this end, we consider changes in bank certificate of deposit (CD) rates, or time deposit rates. Banks typically offer higher rates on CDs than on non-maturity deposits, and CD rates tend to respond more strongly to changes in the federal funds rate. Unlike non-maturity deposits, CDs have contractual maturities. Depositors can generally withdraw their funds prior to maturity, but doing so typically incurs an early-withdrawal penalty. We construct an aggregate bank CD rate as the simple average of national CD rate series for the following maturities: 12, 18, 24, 30, 36, 48, and 60 months. The data are sourced from RateWatch.

Figure OA.G.1 reports estimates from the baseline local projection specification, replacing changes in non-maturity deposit rates with changes in CD rates. As with non-maturity deposit rates, stablecoin growth slows following increases in bank CD rates. The OLS and IV estimated reduction in stablecoin market cap growth are -2.2 percent and -15.5 percent, respectively. We find no corresponding effect on non-stablecoin crypto market capitalization growth.

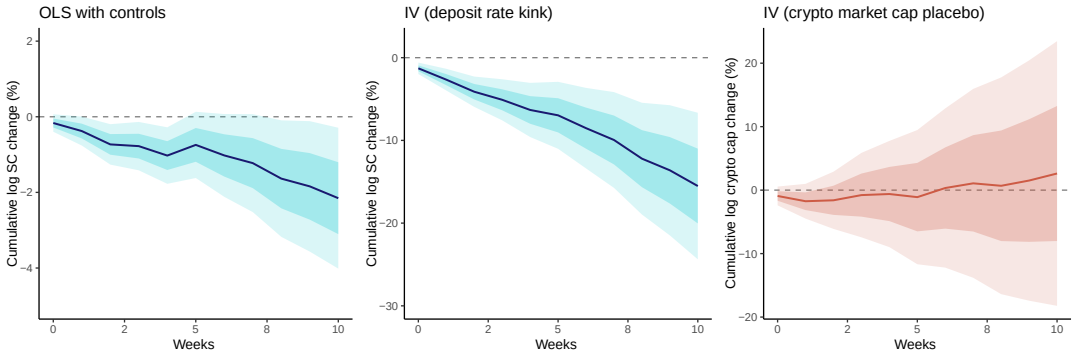


Figure OA.G.1: Full-sample results. Cumulative response to a 1 basis point CD rate increase. Left: OLS with controls. Center: IV using the deposit rate kink. Right: crypto market placebo for the IV specification. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

OA.H Longer local projection horizon

Figure OA.H.1 reports the IRFs from the baseline specification under a local projection horizon of 28 weeks, or just over a period of one-half year. The OLS estimates suggest a -4.9 percentage point decline in stablecoin growth and the IV estimates a decline of -13.6 percentage points after 28 weeks.

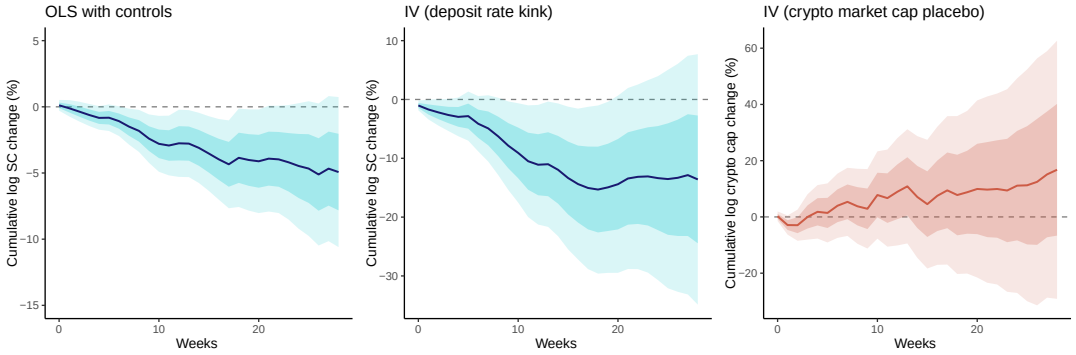


Figure OA.H.1: Full-sample results. Cumulative response to a 1 basis point deposit rate increase. Left: OLS with controls. Center: IV using the deposit rate kink. Right: crypto market placebo for the IV specification. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

OA.I Time trend

The sample features strong secular growth in stablecoin adoption. The baseline specification controls for four lags of stablecoin growth, which captures local trend dynamics. As an additional check, Figure OA.I.1 reports estimates with a linear time trend. The OLS estimate at $h = 10$ is attenuated from roughly -3% to -2.5%, while the IV estimate is attenuated from roughly -9% to -4%.

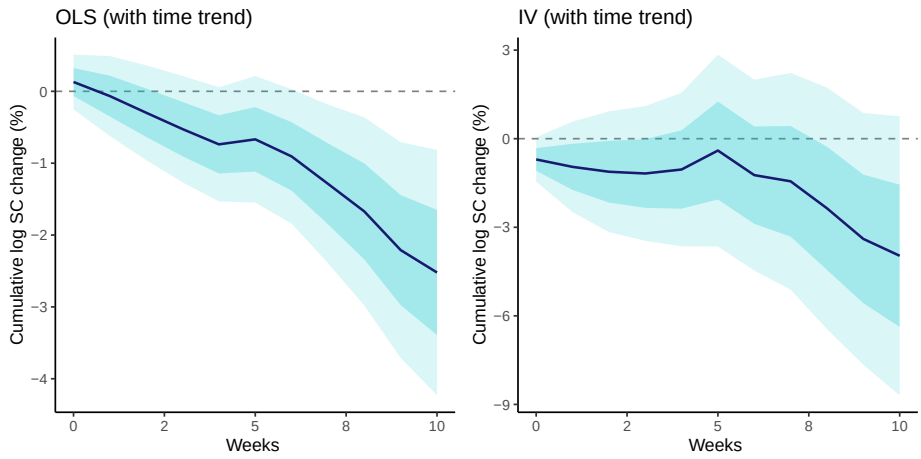


Figure OA.I.1: Full-sample OLS (left) and IV (right) with a linear time trend. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

OA.J Threshold robustness

The baseline threshold of 3.125% corresponds to the midpoint of the 3.00–3.25% FOMC target range. Figure OA.J.1 re-estimates the full-sample IV at thresholds of 2.5%, 3.125%, 3.5%, and 4.0%. The $h = 10$ point estimate ranges from roughly -8.4% to -10.7%, and all specifications produce negative effects. Note that thresholds of 2.5% and 3.125% yield identical results because the federal funds rate transitions discretely between FOMC target steps.

Figure OA.J.2 plots the first-stage sum of squared residuals across a grid of candidate thresholds. The minimum occurs near the chosen value, and the profile is relatively flat, indicating that the results are not sensitive to the precise threshold choice.

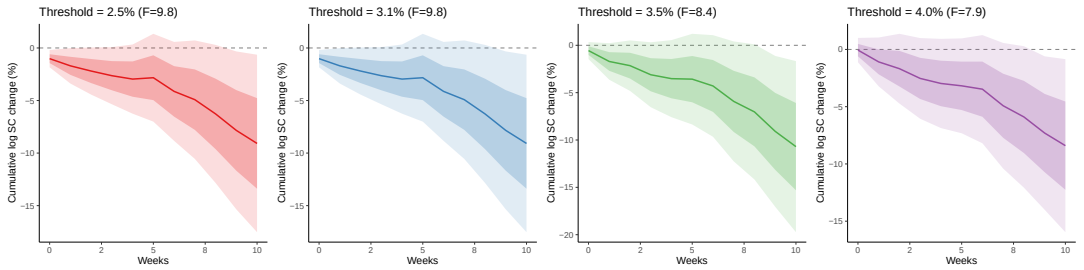


Figure OA.J.1: Full-sample IV at alternative thresholds. First-stage F-statistics reported in panel titles. Darker and lighter shaded regions correspond to 68% and 95% Newey-West confidence bands (bandwidth h).

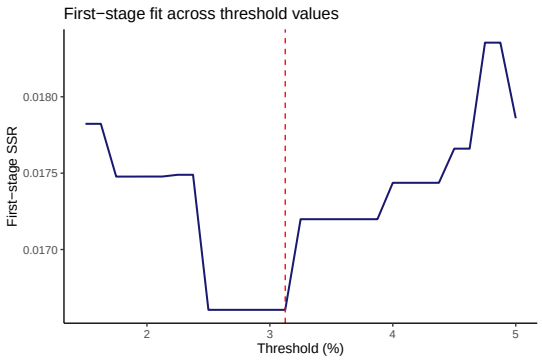


Figure OA.J.2: First-stage sum of squared residuals across candidate thresholds.