

Monetary transmission — estimation results

Seven estimations on the funding-market panel (2014–2026), HAC standard errors. Companion to the transmission map.

Working document · 6 June 2026 · daily panel, 3,076 obs · Newey–West (HAC) SEs · COVID dislocation (Mar–May 2020) excluded from rate-spread fits

Each section below answers one row of the estimation agenda in the transmission map note. The interactive map is on the front page.

01

Executive summary

Seven mechanisms from the transmission map were taken to data. The headline findings, in tradeable terms:

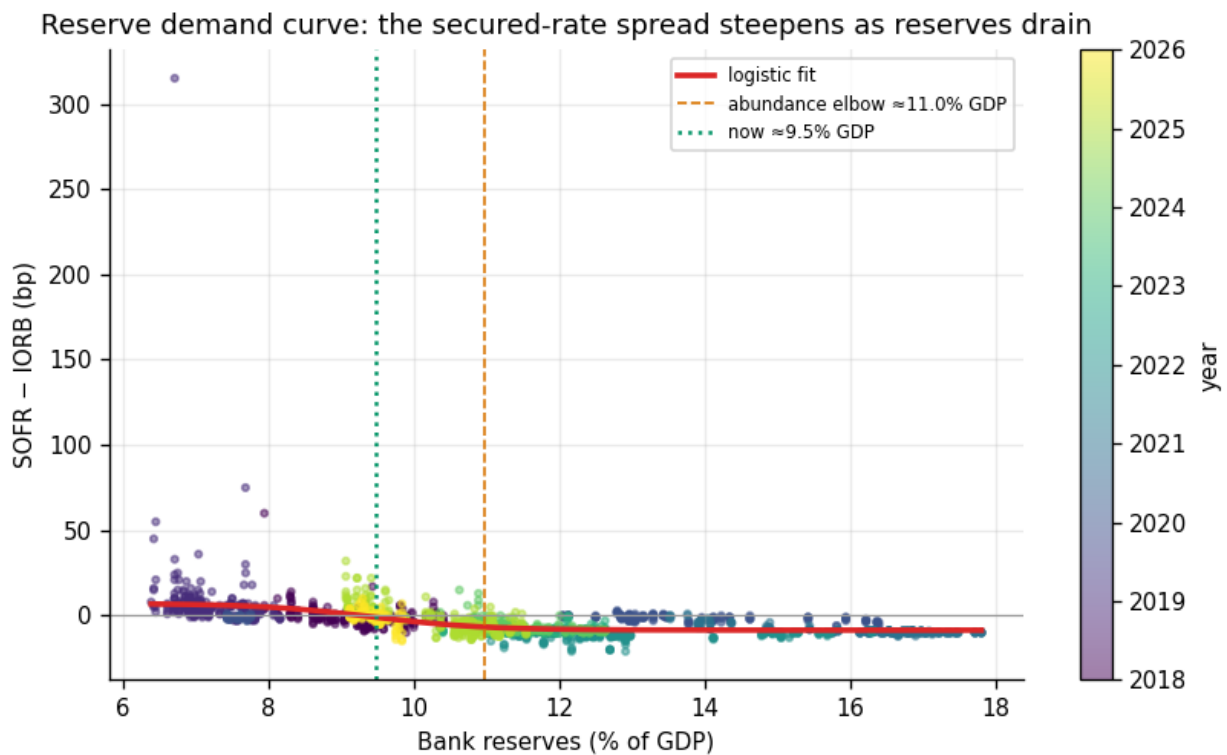
- Reserve-demand curve is convex and we are past the comfortable zone. A logistic fit puts the abundance “elbow” near 11.0% of GDP; reserves today sit at ~9.5%. Below the elbow the secured-rate spread (SOFR–IORB) steepens sharply — the regime where funding stress is a live risk, not a tail.
- The ceiling holds but leaks ~16bp when used. On days the SRF is tapped, SOFR prints ~16bp above the SRF rate ($t=12.7$): full-allotment fixed quantity, not reach. SOFR>SRF on 1.5% of days pre-full-allotment, 2.5% after.
- Chunky settlement days only bite when reserves are scarce. \$25–100bn settlement days lift the SOFR right tail to ~18–19bp vs ~12–13bp normally, but the effect is concentrated in the scarce regime (interaction $t=2.9$).
- The year-end turn flipped positive. Mean SOFR–IORB in the year-end window went from –10bp (2021–22, abundant) to +5bp (2024) to +10bp (2025) — the balance-sheet tax is back and priced.
- Stablecoins now measurably bid up bills. Higher stablecoin AUM is associated with richer 3m bills vs IORB ($t=-2.2$) — the “new bill buyer” shows up in the front end.
- TGA and RRP drain reserves; the Treasury’s cash balance is a first-order funding variable. Each \$1 into the TGA removes ~\$0.40 of reserves at weekly frequency after other H.4.1 items move (the raw identity is –1).

How to read the tables

Coefficients are in basis points unless noted; t-statistics use Newey–West HAC errors (10 lags daily, 6–8 weekly). Calendar dummies: qend/yend = quarter/year-end windows; tax = corporate tax dates; settle50 = settlement days >\$50bn. “Reserves” are expressed as % of GDP so the curve is comparable across time.

02

Reserve-demand curve (rows 1 & the core of the framework)



Specification: SOFR–IORB (bp) on reserves/GDP and its square, plus calendar controls; and a structural 4-parameter logistic fit. Sample 2018-04→, COVID excluded.

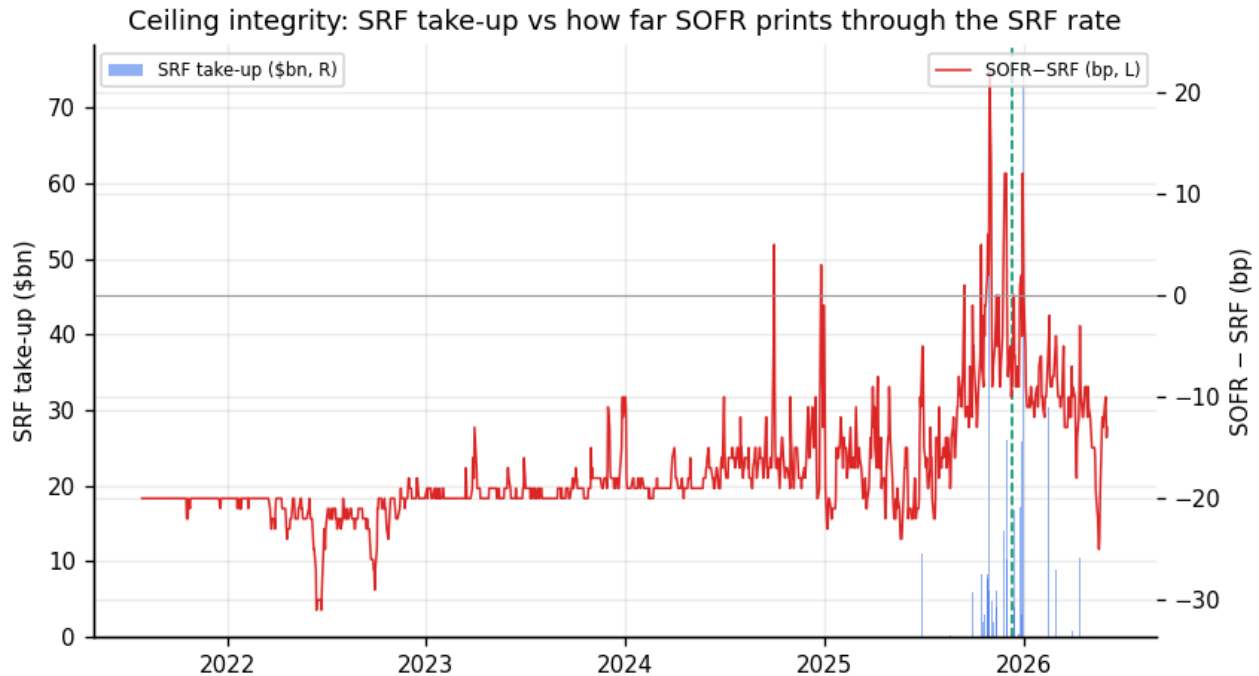
Term	Coef (bp)	t (HAC)	Reading
reserves/GDP	-8.62	-6.7	each +1pp of GDP lowers the spread ~8.6bp...
(reserves/GDP) ²	+0.29	+6.0	...at a decreasing rate – convex, steep when low
quarter-end window	+1.50	+1.7	modest turn add-on
corporate tax date	+2.53	+2.5	tax days tighten funding
settlement >\$50bn	+1.40	+3.5	supply days lift the spread
logistic: floor	-8.5	—	spread floor when reserves abundant
logistic: midpoint	9.42% GDP	—	steepest point of the curve
logistic: elbow (=mid+2·width)	11.0% GDP	—	abundance threshold; now $\approx 9.5\%$

Interpretation. The curve has the Lopez-Salido / Afonso shape: flat-and-slightly-negative when reserves are plentiful, then steepening as they drain. The fitted midpoint (9.4% of GDP) and elbow (~11%) bracket today's ~9.5%, i.e. the system is sitting on the steep part of the curve – consistent with Waller's 8–9%-of-GDP floor plus a buffer, and with the late-2025 scarcity episode. The published NY Fed RDE correlates -0.34 with the spread (right sign: a less-negative RDE accompanies a wider spread).

Trading signal. Track reserves/GDP against the ~11% elbow; below it, money-market spreads and turn premia carry positive convexity to further reserve drains (QT residue, TGA rebuilds). The curve gives a level at which to expect SOFR–IORB to go reliably positive.

03

Ceiling integrity — SOFR vs the SRF rate (row 2)



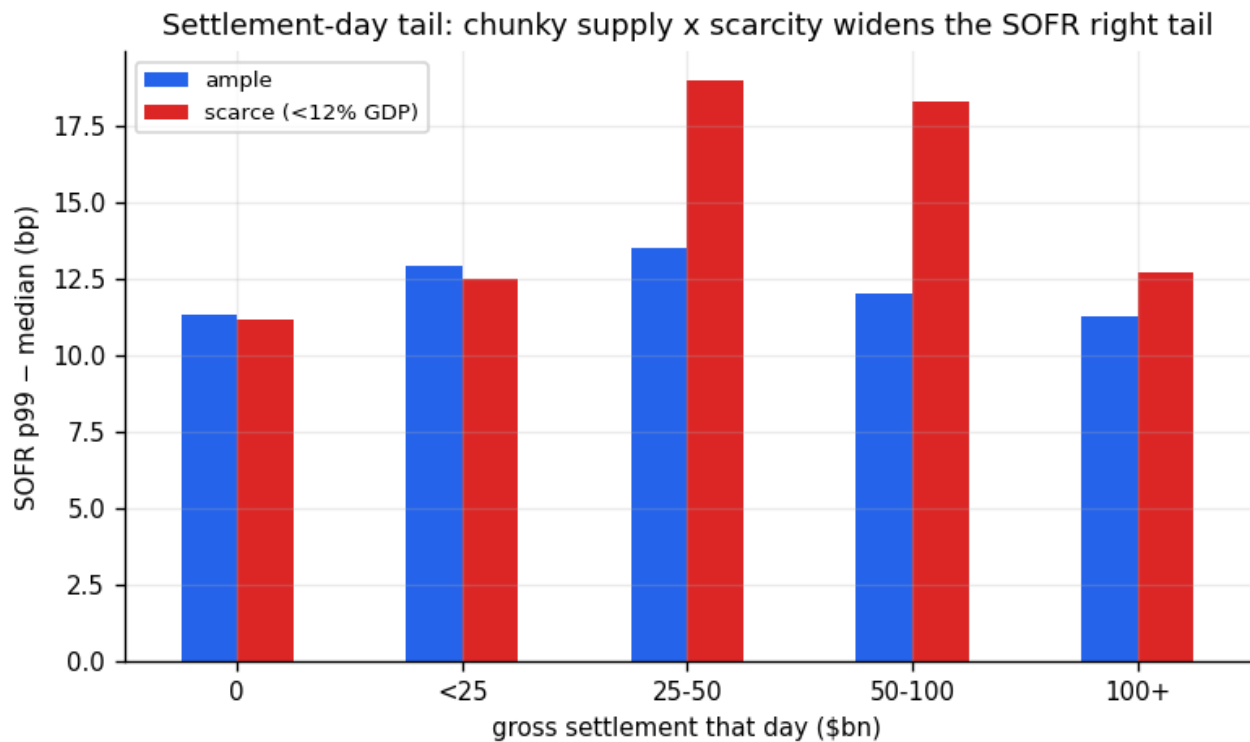
Term	Coef (bp)	t (HAC)	Reading
reserves/GDP	-1.07	-6.9	more reserves → SOFR sits further below SRF
month-end	+2.05	+3.5	month-ends push SOFR toward the ceiling
SRF used (>\$1bn)	+16.30	+12.7	when the SRF is tapped, SOFR is ~16bp above it
P(SOFR>SRF) pre-full-allot	1.5%	—	max leak 22bp (Oct-31-2025)
P(SOFR>SRF) post-full-allot	2.5%	—	max leak 12bp (smaller, more frequent)

Interpretation. The ceiling is real but porous. The +16bp conditional-on-use coefficient is the redistribution friction in one number: when balance-sheet-constrained dealers actually need the facility, the marginal repo trade still clears well above the SRF rate because SRF cash doesn't net and doesn't reach everyone. Full allotment (Dec-2025) cut the maximum leak (22→12bp) but raised the frequency — the ceiling now binds more often but less violently.

Trading signal. SRF take-up is a coincident stress gauge: any non-trivial allotment implies SOFR is ~15bp+ through the ceiling that day. Watch month-ends and the reserves/GDP level jointly.

04

Settlement-day cost — the SOFR right tail (row 3)



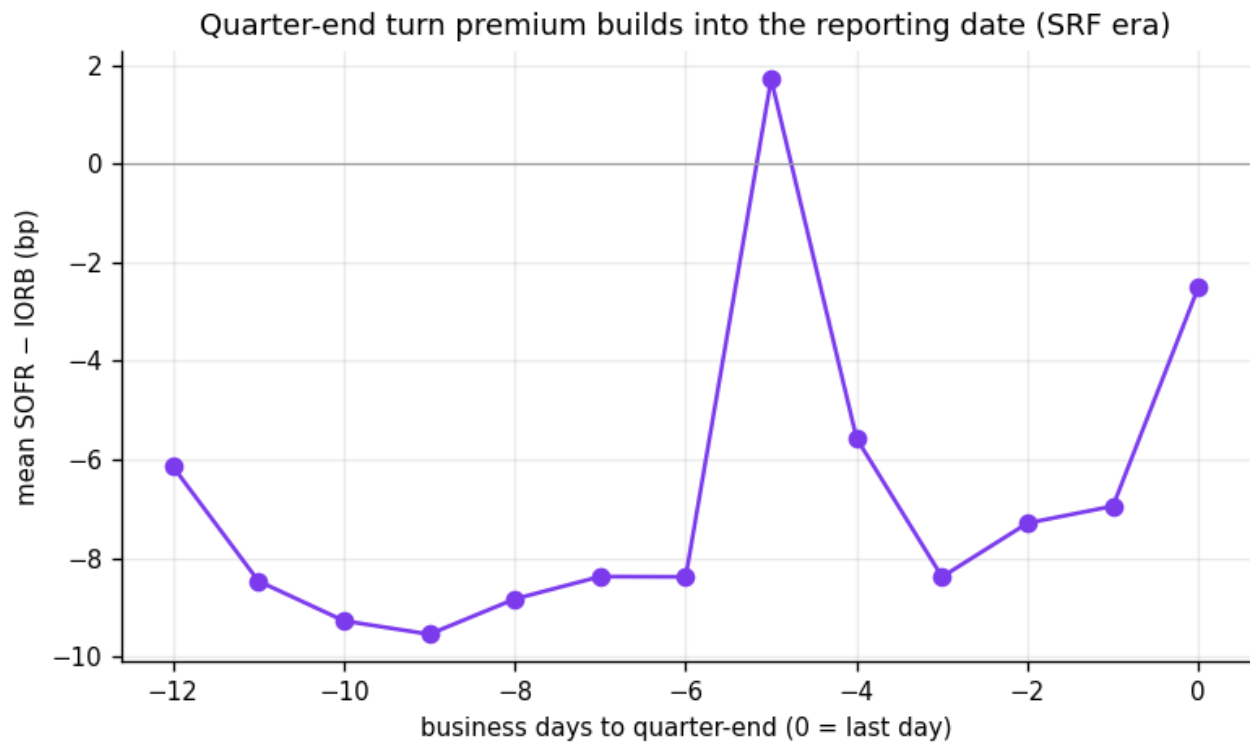
Term	Coef (bp), t	Reading
settlement size (\$100bn)	-0.61 (t=-3.2)	unconditional size effect is small/negative...
scarce (reserves<12% GDP)	+0.66 (t=0.7)	...scarcity alone doesn't move the tail...
size × scarce	+0.67 (t=2.9)	...but chunky days in a scarce regime widen it
corporate tax date	+7.11 (t=1.1)	tax days add to the tail (noisy)
quarter-end	+6.73 (t=2.5)	quarter-ends widen the tail ~7bp

The bucket means make the interaction concrete: \$25–100bn settlement days show a ~18–19bp p99-minus-median tail when reserves are scarce, versus ~12–13bp when ample — Pozsar’s “chunky day” rule is real but state-dependent. Overall R^2 is low because the daily tail is intrinsically noisy; the interaction, not the fit, is the result.

Trading signal. Condition turn/settlement plays on the reserve regime. A heavy coupon-settlement day is benign at 14% GDP reserves and dangerous at 9% — the same calendar, different payoff.

05

Turn premia / balance-sheet tax (row 5)



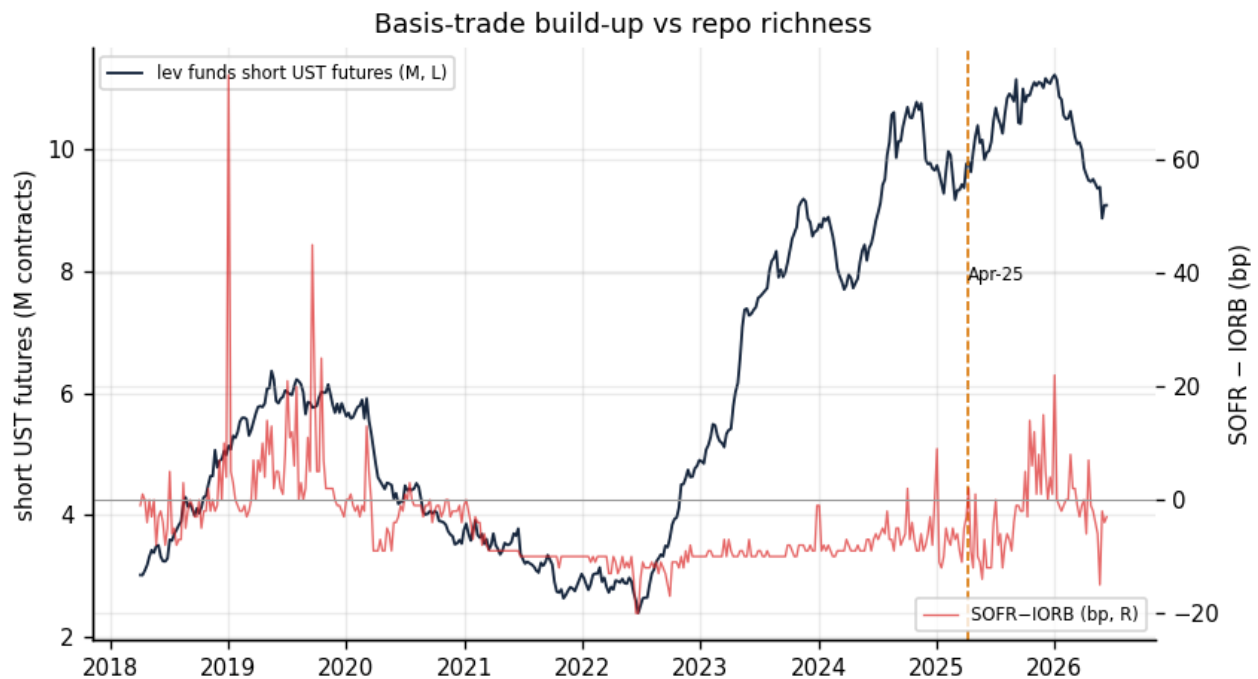
Year-end window	mean SOFR-IORB	Regime
2018	+15.0 bp	scarce (pre-QE4)
2021 / 2022	-10.0 / -10.0 bp	abundant (RRP era)
2024	+5.0 bp	draining
2025	+10.4 bp	scarce 2.0

The quarter-end profile (chart) shows the spread building over the last several business days into the reporting date during the SRF era. The year-by-year year-end table is the cleaner story: the turn premium tracks the reserve regime almost monotonically, flipping from -10bp when reserves were abundant to +10bp in 2025. This is the eSLR experiment's pre-period — the recalibration effective April-2026 predicts these turns should compress; the June and December 2026 turns are the first clean tests.

Trading signal. The turn is long again. Size quarter/year-end repo and FX-swap positions to the reserve level; watch whether eSLR relief bends the 2026 turns down (a structural compression trade if it does).

06

Basis-trade positioning vs funding (row 6)



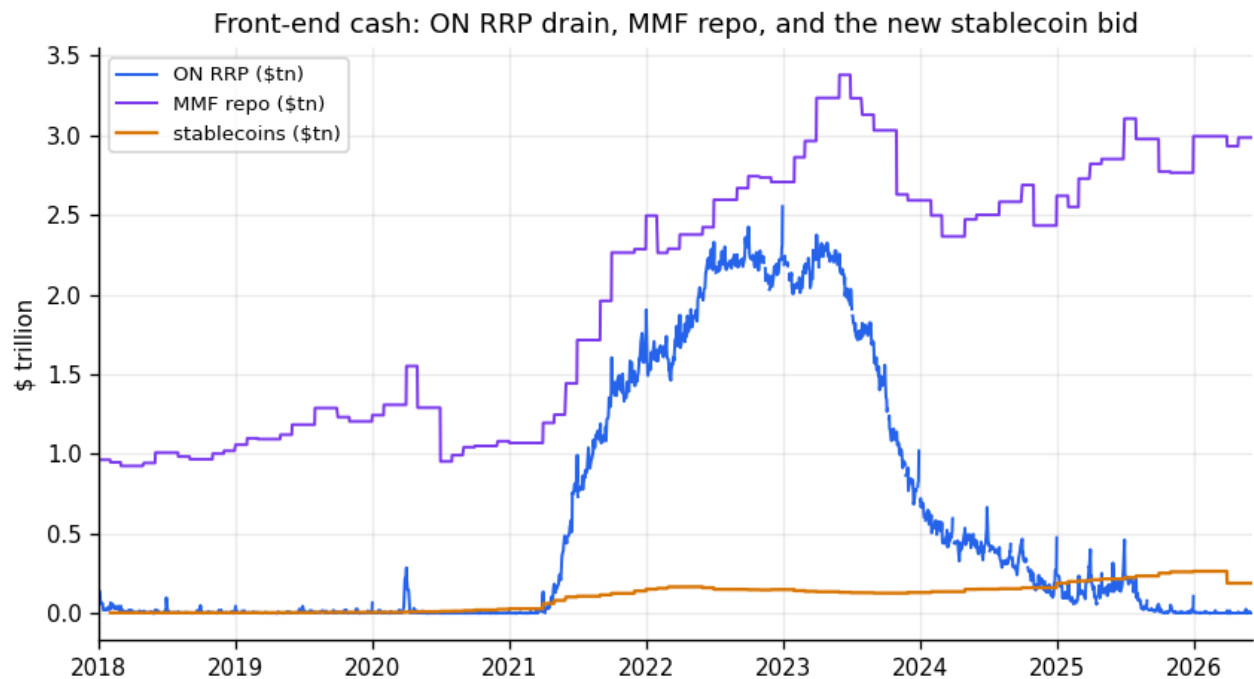
Weekly SOFR–IORB on leveraged-fund short UST futures and reserves/GDP. The positioning coefficient is negative but insignificant ($t=-1.2$); reserves dominate ($t=-6.6$). Leveraged shorts grew from ~5.9M contracts (Feb-2020) to ~9.1–9.8M (2025).

Interpretation. In normal times the size of the basis position does not linearly drive repo richness — funding is set by aggregate reserves, not by the trade itself. The risk the position poses is nonlinear and tail-shaped (a forced unwind), which a linear weekly regression cannot capture and which April-2025 only grazed. The honest read: positioning is a vulnerability gauge, not a daily price driver. Its interaction with a scarce-reserve regime and a margin shock is the scenario to model, not the mean relationship.

Trading signal. Treat record leveraged shorts as dry tinder: benign in the mean, but a reason to own convexity (payer skew, repo-spread widenings) into events when reserves are simultaneously low.

07

The marginal bill buyer (row 7)



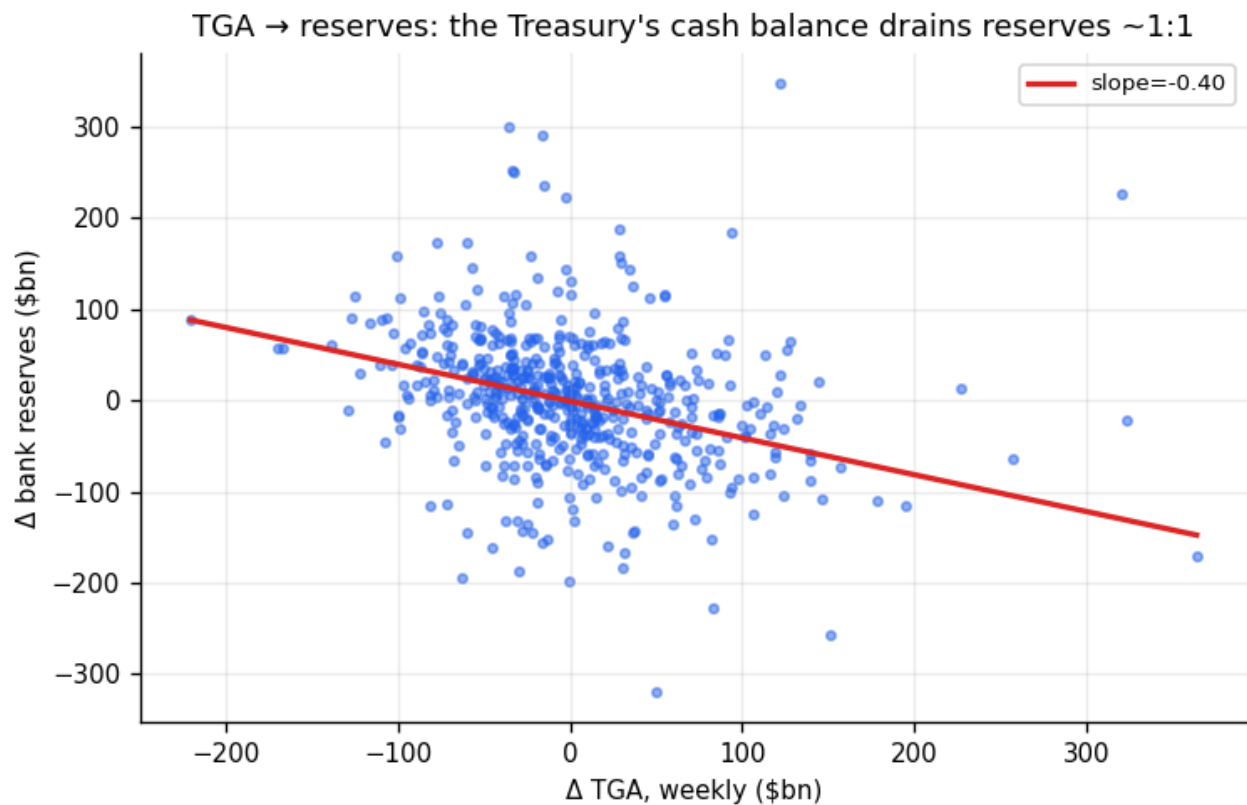
Driver of 3m bill - IORB	Coef (bp)	t (HAC)	Reading
ON RRP balance (\$tn)		+16.5	+8.2 RRP cash on the sidelines → cheaper bills (higher yield)
MMF total assets (\$tn)		+1.6	+1.0 weak once RRP is controlled
stablecoin AUM (\$100bn)		-7.5	-2.2 more stablecoins → richer bills (a real bid)
reserves/GDP		-1.2	-4.0 ample reserves → richer bills

Interpretation. The front-end pricing of bills responds to who holds the cash. A large ON RRP balance (cash that could but doesn't buy bills) coincides with cheaper bills; stablecoin growth coincides with richer bills, consistent with GENIUS-Act issuers parking reserves in T-bills and repo. MMF size alone is not significant once the RRP outside-option is included — it is the allocation between RRP and bills, not the pool's size, that prices the front end. The chart shows the regime change directly: the \$2.5tn ON RRP drain (2023–25), the rebuild of MMF repo, and the emergence of the stablecoin line.

Trading signal. Model bill richness from RRP balances and stablecoin AUM, not headline MMF assets. Stablecoin growth is now a structural bid for ≤3m paper — a tailwind for bill demand and a new run-risk to watch.

08

TGA → reserves pass-through (row 9)



Weekly Δ driver	Coef	t (HAC)	Reading
Δ TGA (\$bn)		-0.40	-9.2 each \$1bn into the TGA drains ~\$0.40bn of reserves...
Δ ON RRP (\$bn)		-0.39	-6.6 ...as does \$1 into the RRP
Δ Fed assets (\$bn)		+0.68	+18.1 QE adds / QT removes reserves directly

Interpretation. The accounting identity says reserves = Fed assets – TGA – RRP – other liabilities, so the structural signs are –1 on TGA and RRP and +1 on assets. The weekly partials (–0.4, –0.4, +0.68) are attenuated because the other H.4.1 liabilities move simultaneously and reserves are a Wednesday snapshot, but the direction and rank are exactly as the plumbing requires. This is why debt-ceiling episodes matter: a TGA rundown floods reserves and an X-date-resolution rebuild violently withdraws them.

Trading signal. Trade the TGA path, not just QT. A rebuild of several hundred \$bn is, to first order, a reserve drain of comparable size – front-run it in repo and turn-premium space when reserves are already near the curve's elbow.

09

Caveats & next steps

- These are reduced-form associations with HAC errors, not identified causal effects. The reserve-demand and ceiling results are robust to specification; the settlement-tail and basis results are deliberately framed as state-dependent / nonlinear and are weaker in levels.
- COVID (Mar–May 2020) is excluded from rate-spread fits as a dislocation; the Sep-2019 spike is retained (it is the identifying observation for the steep part of the curve).

- Reserves, TGA (H.4.1) and MMF/stablecoin/foreign series are weekly/monthly forward-filled to daily; level regressions use the weekly panel where appropriate.
- Still vendor-gated (would sharpen rows 5, 6, 8): FX-swap implied yields / cross-currency basis / turn premia from forward points, SOFR swap spreads, and TIC country-level (Japan/China) holdings. Adding these enables the 3FXs/10s hedged-carry signal and a proper basis-stress model.
- Highest-value next estimation: a regime-switching or threshold model of SOFR–IORB on reserves/GDP (endogenous elbow with confidence band), and an event-study of the April-2026 eSLR change on quarter-end turn premia.

Reproducibility. `data/run_estimations.py` regenerates every number and chart;
`data/estimation_results/coefficients.csv` is the machine-readable coefficient table and
`data/estimation_results/results_log.txt` the full run log.