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Primal Fear: US money market blowups

A tale in 32 slides

August 27, 2025

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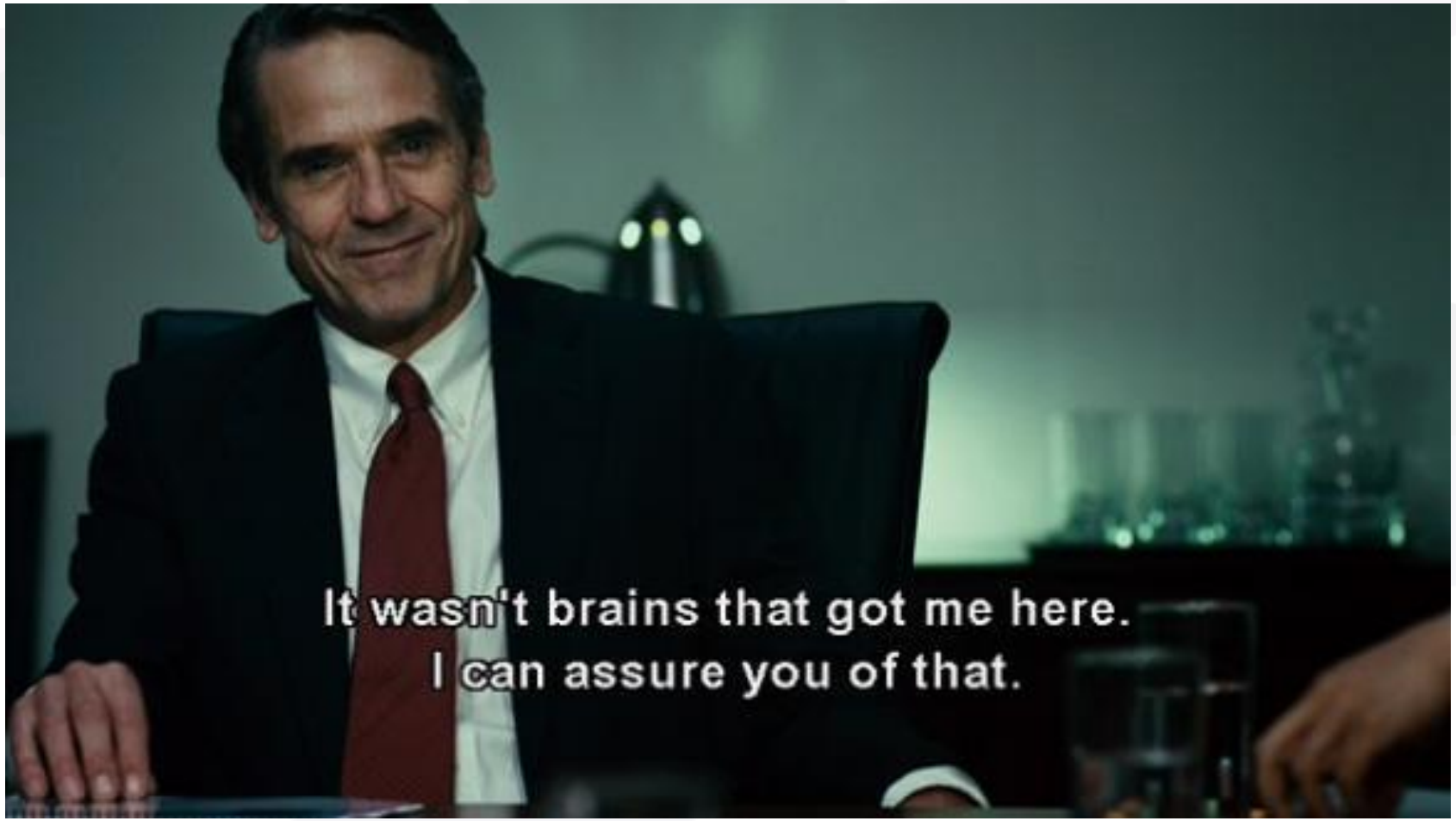
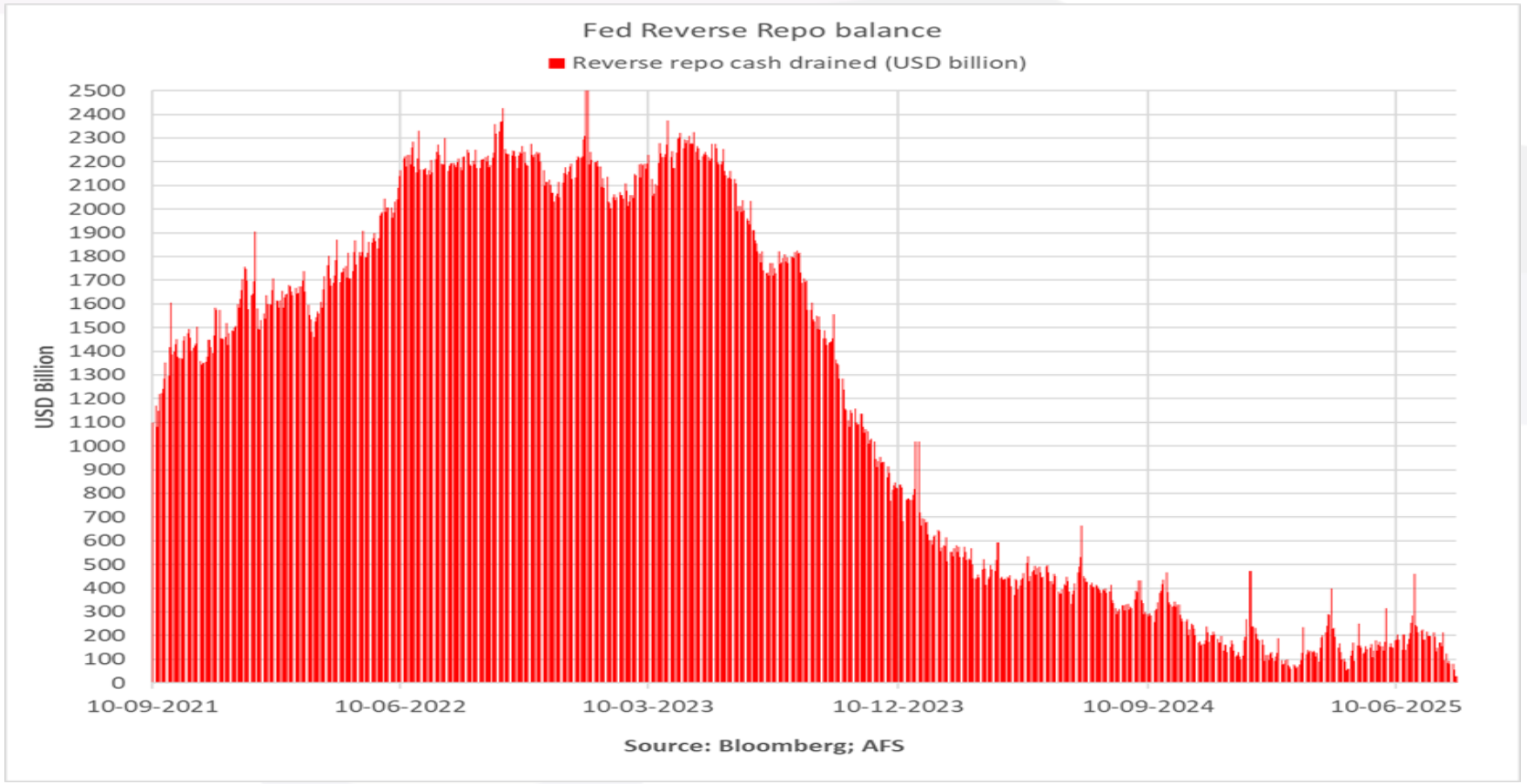
Part 1: Liquidity



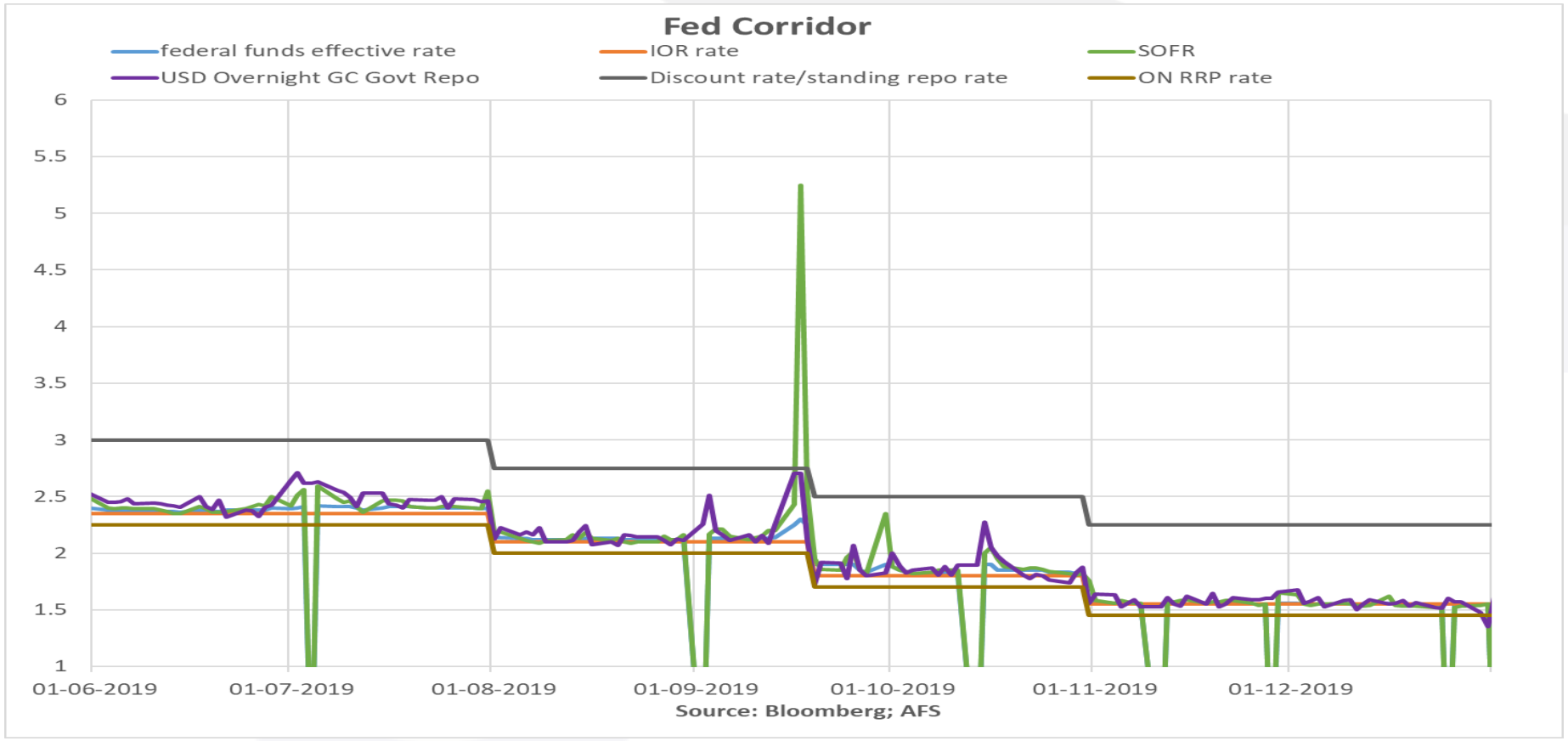
SHTF?

- **Scary chart alert**. If you work at a bank treasury or hedge fund, you're probably intimately familiar with this chart. It's the outstanding amount of reverse repos with the Fed (Fed takes cash, gives collateral);
- **When we hit zero**, which will happen in weeks, the proverbial shit™ will hit the fan, no?



Primal Fear

- **The primal fear (not the movie with Edward Norton) is that when we hit zero, this could happen.** Repo rates spike and literally blow out of the Fed's corridor. That's what happened in September 2019. It's ingrained in the memory of many a money market affinicado;
- **Emergency repo *lending and QE* by the Fed brought spreads back down to earth.** Which begs the question. Are we there yet?



Litquidity, for lack of a better word

- **No, we're not even close to another US money market tantrum**, which always and anywhere is the result of a squeeze in domestic liquidity conditions;
- **Liquidity is an oft-used and oft-abused word**. In US money markets, liquidity refers to three item lines on the liability side of the Fed's balance sheet: reverse repos; bank reserves; and the US Treasury's account with the Fed (also known as Treasury General Account, or TGA). **Ignore all other liabilities on the balance sheet;**
- **The most important component of liquidity are bank reserves**.

H.4.1

1. Factors Affecting Reserve Balances of Depository Institutions (continued)

Millions of dollars

Reserve Bank credit, related items, and reserve balances of depository institutions at Federal Reserve Banks	Averages of daily figures			Wednesday Aug 13, 2025
	Week ended Aug 13, 2025	Change from week ended		
		Aug 6, 2025	Aug 14, 2024	
Currency in circulation[12]	2,403,845	+ 1,404	+ 55,298	2,403,364
Reverse repurchase agreements[13]	421,504	- 62,199	- 288,759	402,201
Foreign official and international accounts	347,821	- 20,343	- 45,105	344,999
Others	73,683	- 41,856	- 243,654	57,202
Treasury cash holdings	430	+ 18	+ 32	426
Deposits with F.R. Banks, other than reserve balances	732,827	+ 79,002	- 223,331	744,164
Term deposits held by depository institutions	0	0	0	0
U.S. Treasury, General Account	504,304	+ 83,261	- 289,816	515,469
Foreign official	9,434	0	- 247	9,434
Other[14]	219,089	- 4,258	+ 66,732	219,261
Treasury contributions to credit facilities[15]	2,029	0	- 2,929	2,029
Other liabilities and capital[16]	-186,870	- 3,197	- 47,652	-185,906
Total factors, other than reserve balances, absorbing reserve funds	3,373,764	+ 15,027	- 507,343	3,366,277
Reserve balances with Federal Reserve Banks	3,320,050	- 12,442	- 26,088	3,328,346

A truism

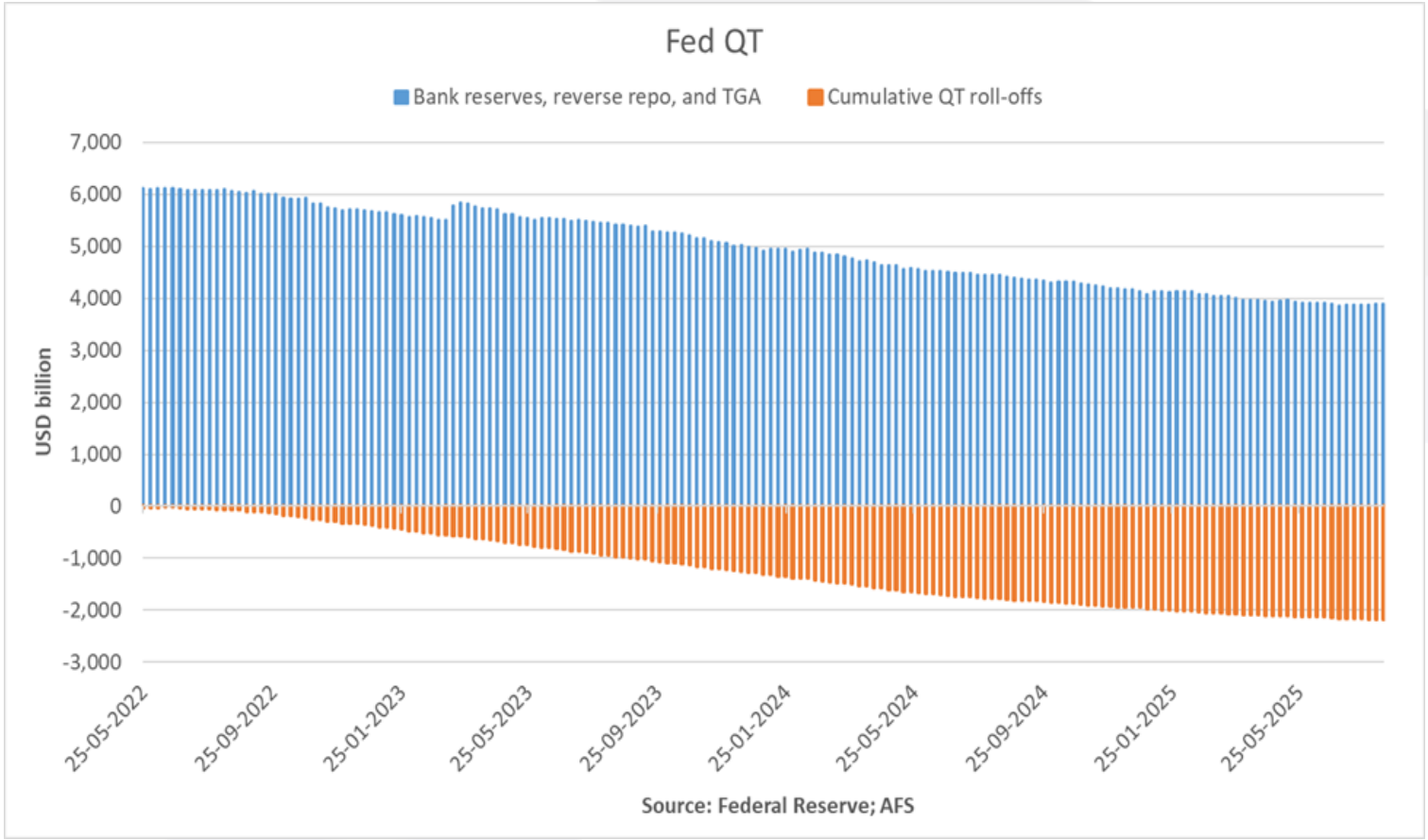
- **Two factors on the Fed's balance sheet have drained the reverse repo facility**: bond holdings because of Quantitative Tightening (QT) first and foremost. And, to a lesser extent, the Treasury General Account increasing;
- **After the debt ceiling was resolved earlier in the year, Treasury ramped up bill issuance, which also lowered reverse repo balances.** Instead of parking cash at the Fed in exchange for collateral, folks simply bought freshly minted bills;
- **While in reality the exact trades and behavior of investors might be somewhat more *diverse* (to use an (un)popular word**), these are all accounting identities and thus always hold true.

Federal Reserve

Assets	**Liabilities**
US Treasury and MBS holdings ⬇	Treasury General Account ⬆
	Reverse repo balances ⬇
	Bank reserves

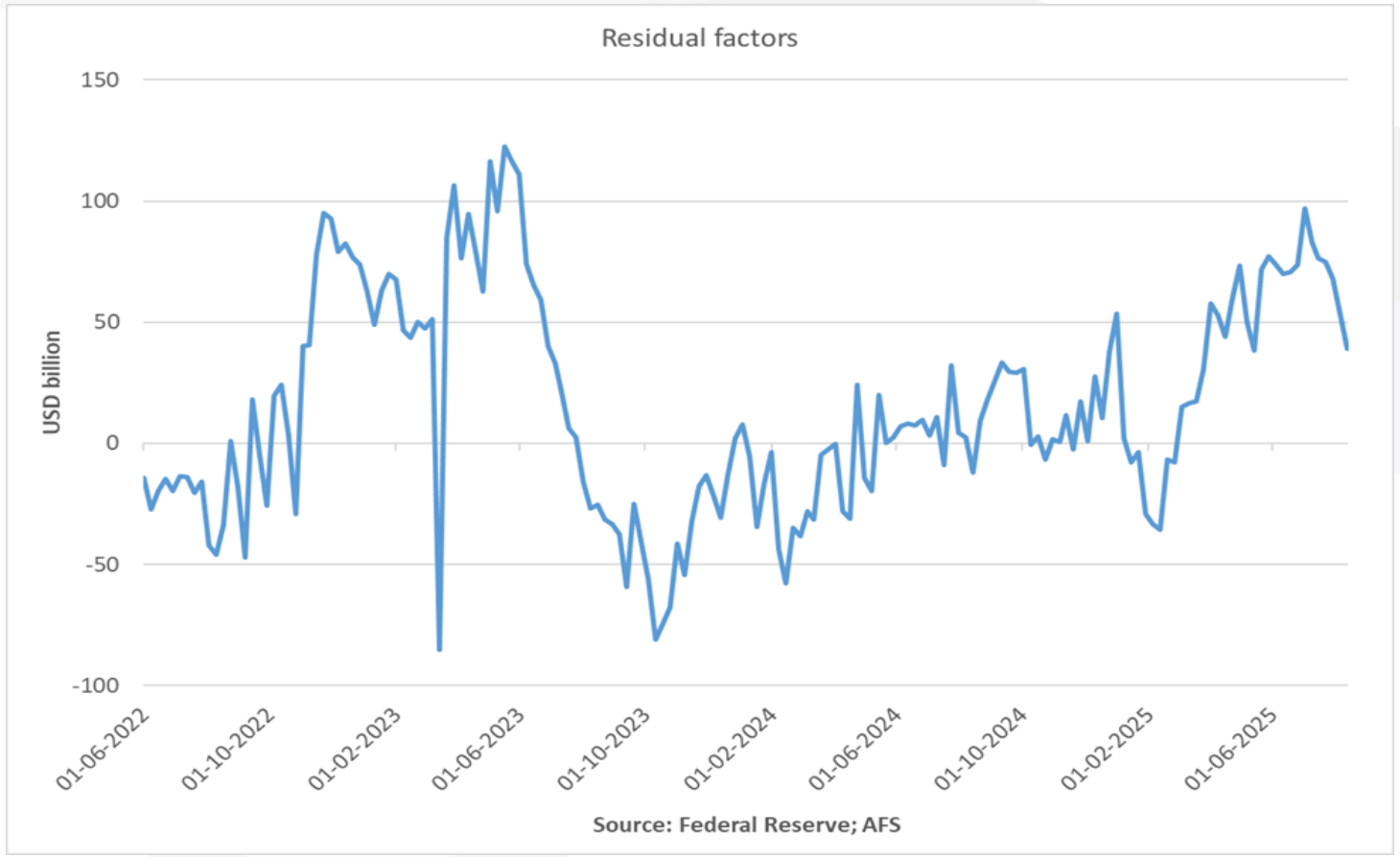
Tapering QT

- **Quantitative Tightening is an ongoing process**. However, the Fed has tapered the pace of QT to about USD40 billion a month. That's a gross amount, by the way. We used to run at a hundred billion or so a month;
- **QT has gradually destroyed liquidity: the sum of bank reserves, TGA, and reverse repos.** But do note the recent flat-lining in liquidity:



About those other factors

- **Yes, I admit it,** several other item and liability lines on the Fed's balance sheet have affected liquidity as of late (in this case: boosted liquidity);
- **However, these residual balance sheet items have not been trending for quite some time**. They're more or less rangebound:



That dirty little secret

- **Probably the most overlooked factor that has been – and still is – boosting liquidity, is the Fed's operating losses;**
- **The Fed's equity is now negative to the tune of USD190 billion**. The Fed's deep dive in the red has boosted liquidity by USD240 billion or thereabout since 2022. A factor most analysts don't even know about.

Money printing comes with a cost

- **The Fed is running operating losses – a negative interest rate margin – in the truest since of the word.** If I had to guess, it Fed probably earns two percent on its Treasuries and maybe 50bps more on its MBS portfolio. It currently pays 4.40 percent on reserves and 4.25 percent on reverse repos;
- **On bank reserves alone it suffers an annual loss of USD75 billion (quick and dirty guesstimate).** That's boosting bank reserves by about USD 6 billion a month. Might not sound like much, but it neutralizes a good chunk of the USD40 billion in Quantitative Tightening;
- **So, money printing comes with a price.** Or, as Milton Friedman used to quip, there's no free lunch.

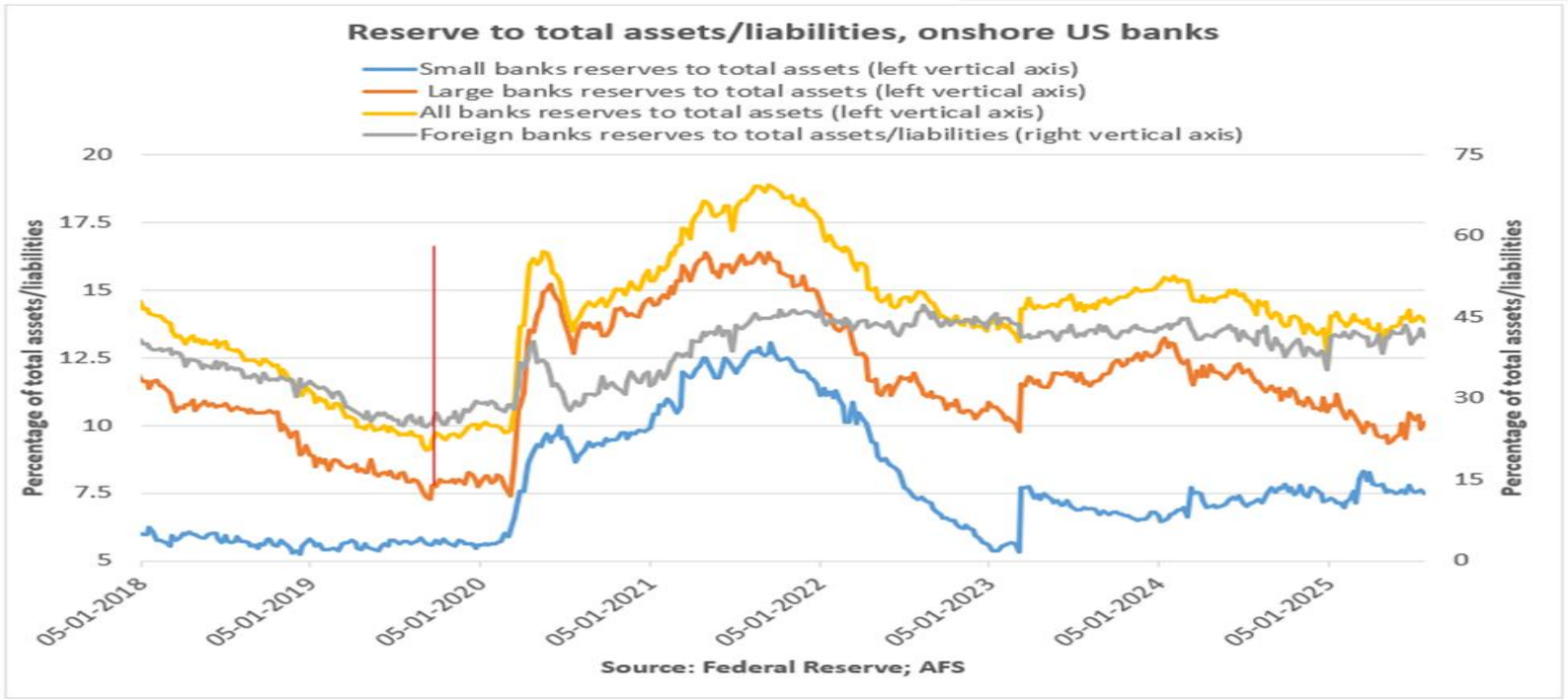
One word: reserves

- **Bottom line: soon we're left with only bank reserves and the Treasury General Account (TGA) as liquidity.** By definition, any further increases in the TGA and reduction in bond holdings will destroy bank reserves;
- **Bank reserves matter the most.** In 2019, the money market blew up not because of basis trades or whatever exotic reason. The blowup happened because bank reserves were scarce to the point of an outright shortage. The Fed was forced to step in to increase the amount of bank reserves, remember? The Fed bought bills and lend out reserves against Treasury collateral;
- **In a sense, that shortage was artificial.** One bank (hello JPMorgan Chase) held all the reserves (well, almost), while many a bank had (very) little. In the US banking system, bank reserves are very, very unequally distributed;
- **So, repeat after me.** It's bank reserves, *stupid;*
- **Which begs the question:** are bank reserves getting scarce?

Part 2: push it to the limit

Far away from the breaking point

- **The Fed publishes superficially segmented data on the distribution of bank reserves**. Charted below are reserves as a percentage of total assets for large and small domestically chartered banks (i.e. US banks to you and me), foreign-owned banks, and all banks (=domestic+foreign);
- **Mind the second vertical axis for foreign banks**, who have no deposit base but hold large reserve balances with the Fed (all acquired wholesale);
- **The red vertical line denotes September 2019** – the date of the money market blow-up:



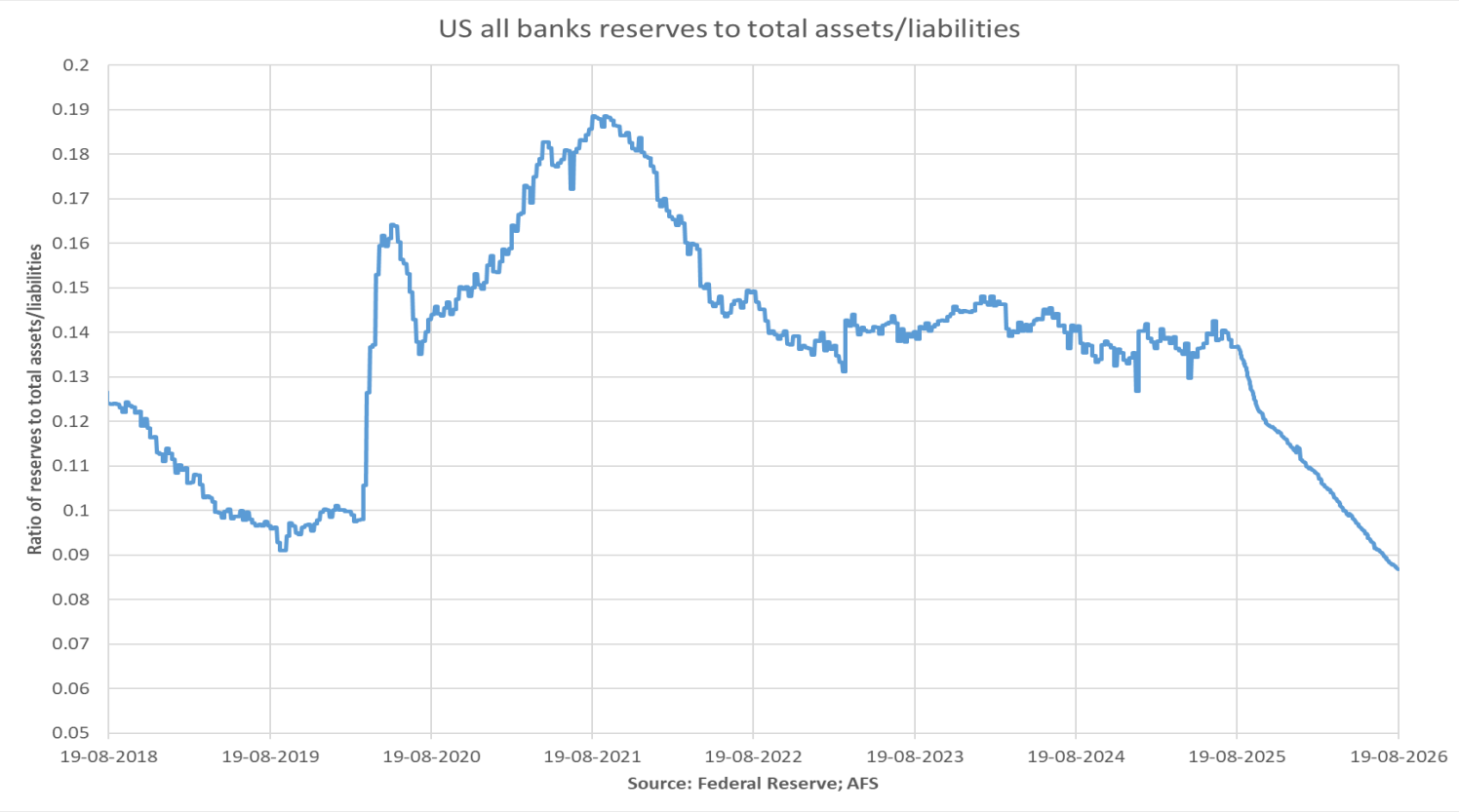
The end is nigh – for QT

- **Currently, reserve ratios for all bank segments are way above their September 2019 levels**. Of course, for various reasons banks might prefer higher reserves ratios than they did six years ago. Furthermore, the distribution of reserves could have become even more unequal.
- **Only a deep dive in the US banking system will give a definitive answer about the adequacy of reserve ratios.** However, I assume that as long we're not close to the autumn 2019 levels, we're safe. Safe in the sense that we should see no SOFR/fed funds spikes;
- **By the turn of the year bank reserves, currently at USD3,350 billion, will decline by:**
  - QT net of Fed operating losses amounting to USD330 billion
  - Treasury balance increasing by USD300 billion to its preferred level of around USD800 billion
  - Adjust for the remaining recourse to the Fed's reverse repo facility (USD50 billion)

- **That leaves us with USD2,770 billion USD in bank reserves by the turn of the year.** Assuming banking system assets/liabilities grow at their current four percent annual rate, the reserve ratio of all banks will drop to 11.3 percent, down from 13.8 percent currently. That compares with a pre-blowup ratio (the 2019 blowup) of 9.7 percent;
- **A ten percent reserve ratio we will reach in the early spring at the current pace of QT**;
- **If the reserve ratio metric is still a reliable indicator for money market spreads**, the Fed will likely end QT in the first quarter of 2026.

The reserve ratio

- **The chart below shows the forecasted decline in the reserve ratio.** Note the linear decline, which is steep in the near term because of the Treasury rebuilding its balance at the Fed. In reality, the pattern will be somewhat erratic because of swings in the Treasury balance. Swings in the Treasury balance will result in corresponding temporary deviations (both to the upside and downside) from the trend of decreasing bank reserves.



Reserves matter – a lot

- **Bank reserves are the key input for money market spread models.** I've built models for both the fed funds spread with the Fed's Interest on Reserves Rate (IOR) and SOFR versus IOR);

- **SOFR is difficult to model because of daily gyrations in the spread with IOR.** Hence, I model the 20-day moving average;

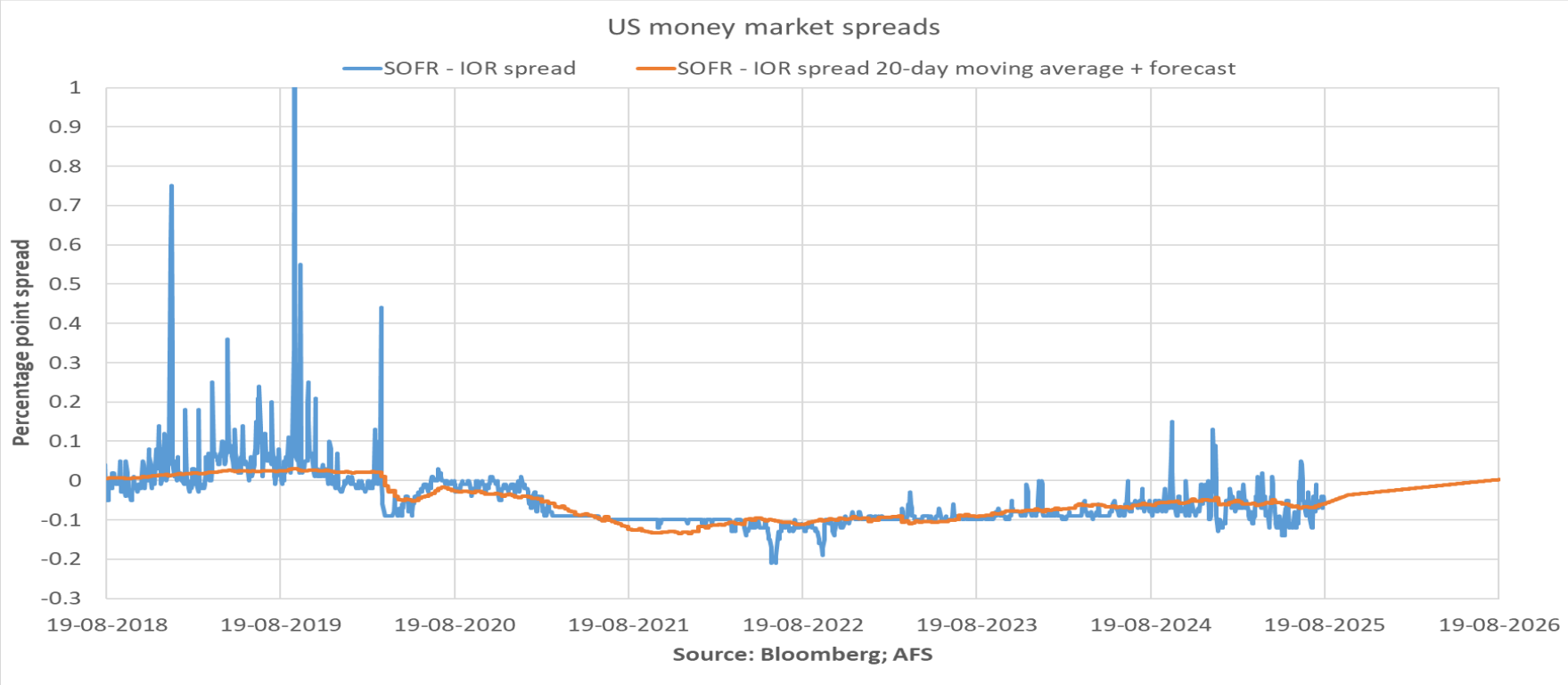
- **Inputs for the SOFR spread model are unborrowed bank (reserves bank reserves net of borrowings from the Fed),** the Treasury's balance, and the Fed's reverse repo facility outstanding balance;

- **These models are still 'rough around the edges'.** Notice that I used absolute levels and not relative levels (i.e. bank reserves instead of bank reserves to total assets/liabilities). In any case it's my first attempt at US money market spreads – the confidence level is lower than for my Eurozone models. We're a euro money market broker after all;

- **Models with better independent variables will certainly follow.** But that will take time.

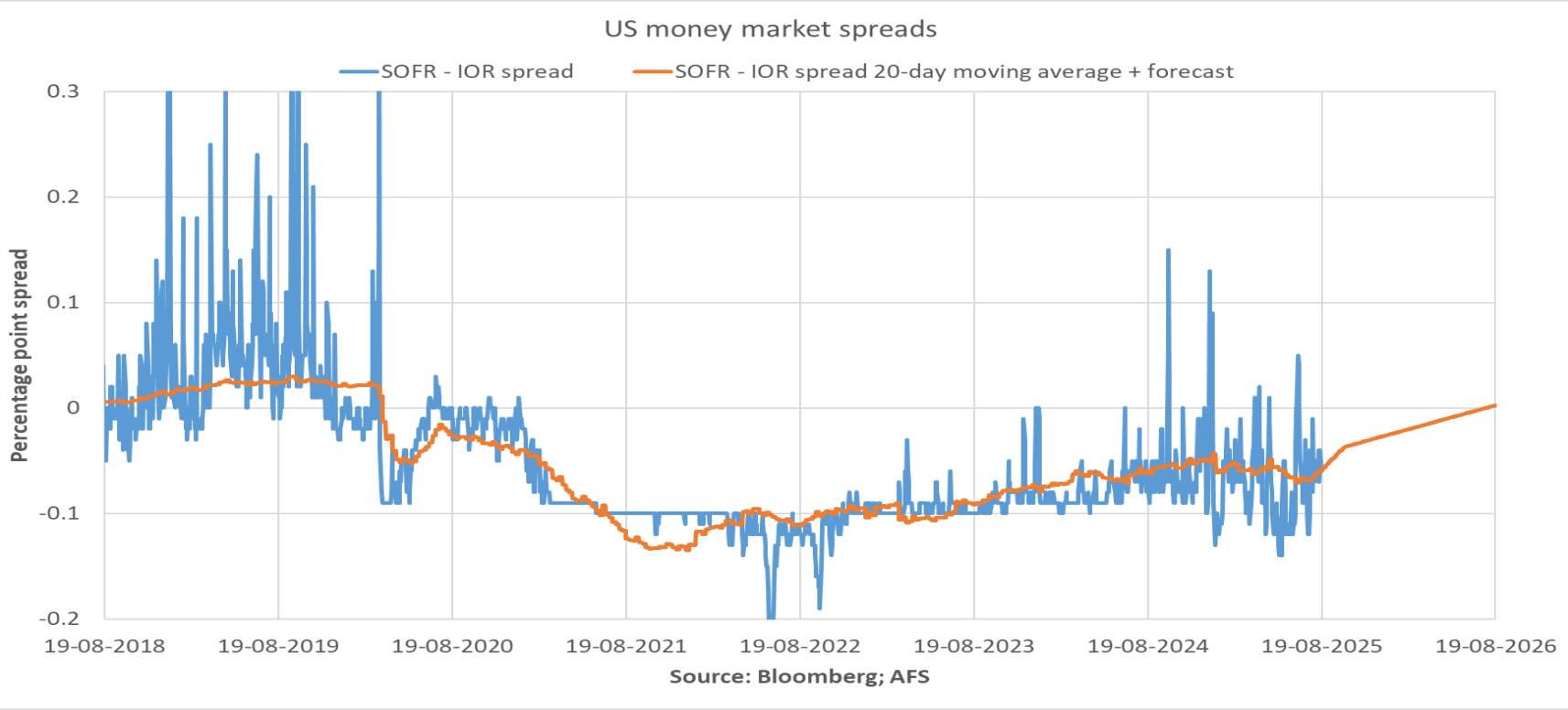
That 2019 feeling (1/2)

- **Here's the actual SOFR – IOR spread,** the 20-day moving average spread, and the forecast for the 20-day moving average spread. Because of scaling the chart for the SOFR spread spike in September 2019 (3.15 percentage points – apologies for not using basis points), the chart is not very informative;
- **Most spikes are idiosyncratic or related to turn effects.** There are two notable exceptions: September 2019 and March 2020.



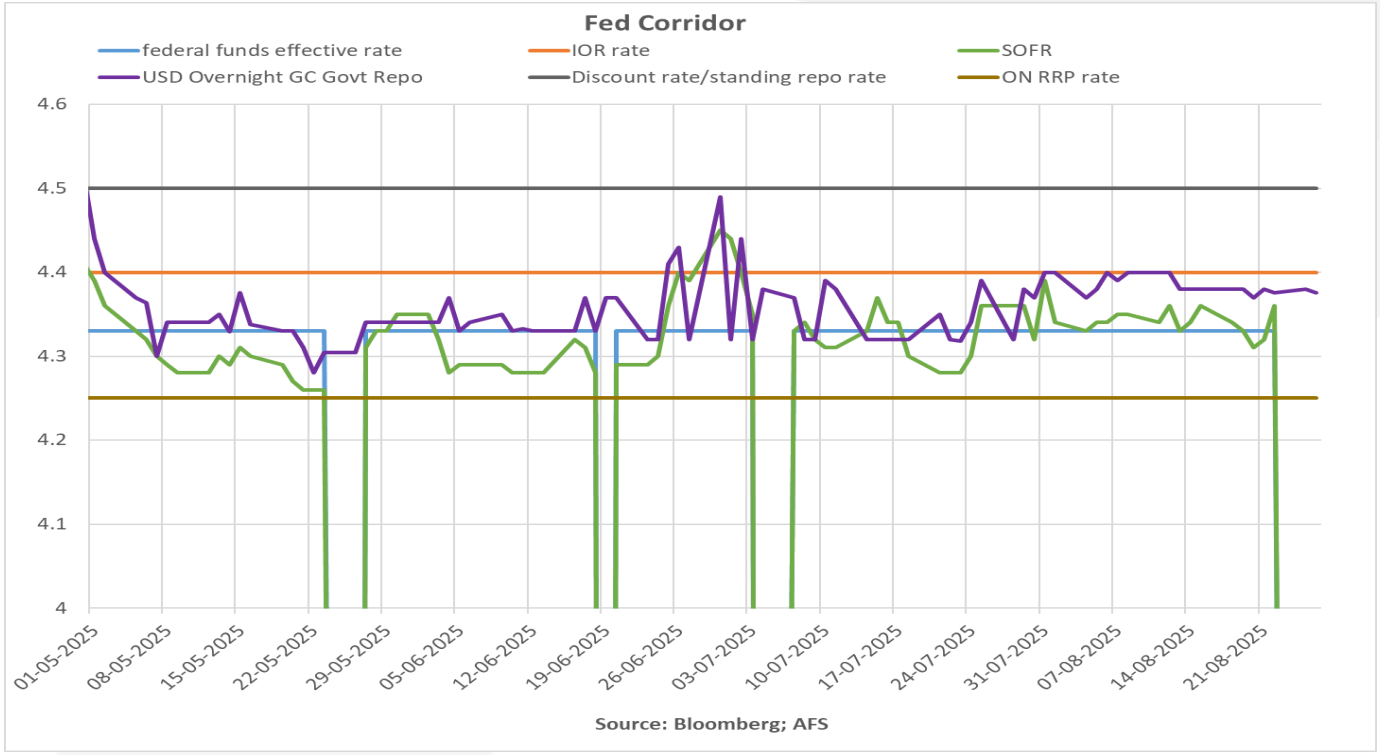
That 2019 feeling (2/2)

- **Let's rescale.** The thing to watch is the September 2019 spike – ignore the March 2020 spike because the trigger was exogenous (the pandemic and people literally running for the hills);
- **Problems emerged when the SOFR 20-day moving average settlement was 2.5bps above IOR**;
- **Based on the current trajectory for QT**, the average settlement is forecasted to remain below 2.5 bps across the forecast horizon.



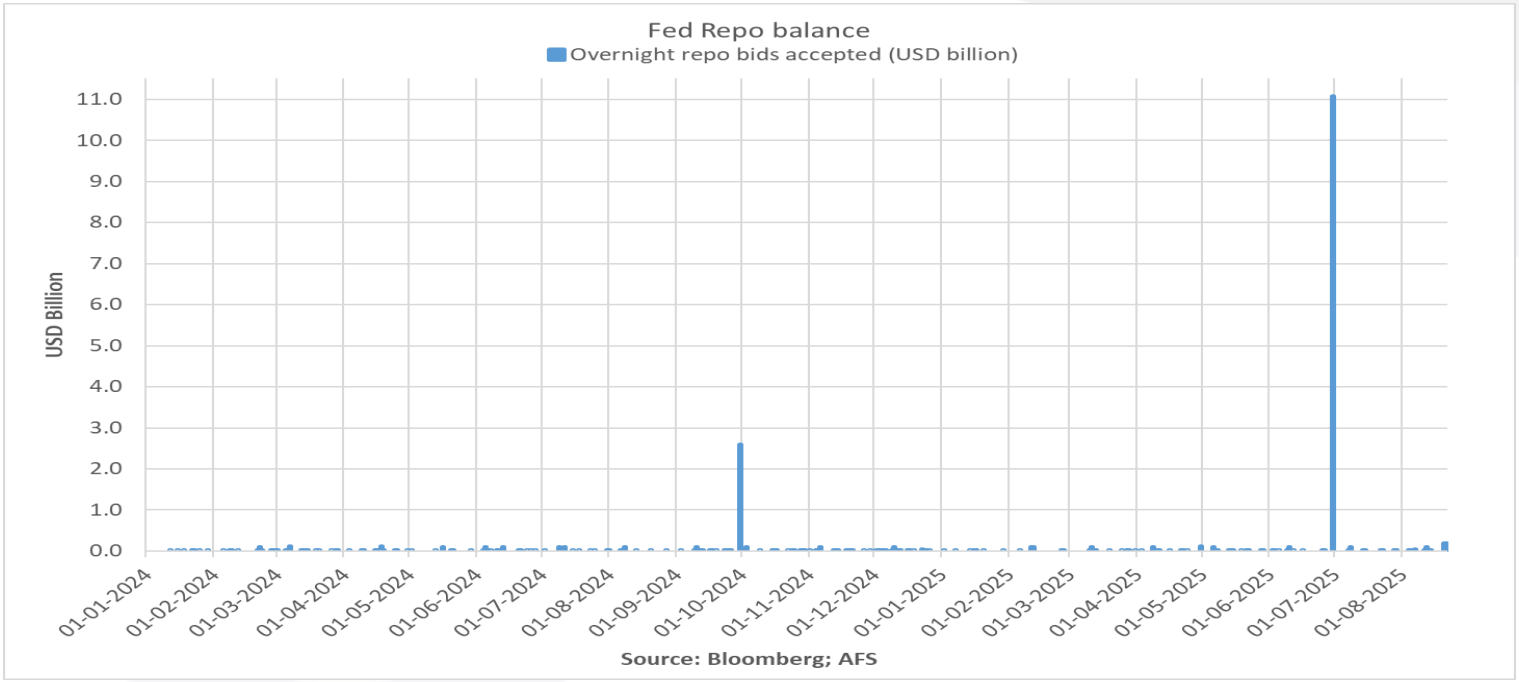
Pushing the envelope

- **The Fed could run QT well beyond August 2026, when the SOFR spread is forecasted to be zero.** That's because the Fed has now backstopped the repo market to address a potential shortage of reserves with the standing repo facility. In 2019, there was no such backstop. Yes, there was the discount window, but it suffers from an almost (irredeemable) stigma;
- **The interest rate on the standing repo facility is a measly 10bps above IOR.** Which makes for a very narrow corridor indeed. If the facility works, repo benchmarks should settle within the corridor except for *minor* deviations.



Frictions

- **Recourse to the repo facility has been negligible until the recent half year turn, when counterparties borrowed USD11 billion.** But we absolutely cannot attribute the borrowing spike to an overall shortage of reserves. Over the recent half year turn, cash parked at the Fed's reverse repo facility peaked at a very large USD461 billion, up USD200 billion from the day before the turn. That dichotomy – excessive recourse to the Fed's two standing secured facilities points to deep frictions in the money market;
- **Now here's the thing**. If reverse repo recourse jumps, and the Treasury cash balance is unchanged, then by definition banks will face a quite severe drain of reserves over the turn;



Part 3: not your grandfather's scissors effect

The Scissors Effect

- **Realize that we now have the Scissors Effect at work in the US money market, albeit very small scissors at that, and with a twist.** The Scissors Effect is a term coined by the economic historians Milton Friedman and Anna Schwartz. It means that a decline in bank reserves stemming from QT is offset by bank borrowing of reserves – in this case through the Standing Repo facility;
- **The Scissors Effect will become more pronounced the lower the level of unborrowed reserves becomes because of ongoing Fed QT.** Not that the Fed will mind as the scissors effect is a profitable endeavor. The Fed makes net 10bps on the lending (the borrowings always show up as reserves that the Fed remunerates at IOER);
- **The Standing Repo Facility has a total daily borrowing limit of USD500 billion and a single counterparty limit of USD160 billion.** Given the relatively slow pace of QT, I do not think either limit will be a constraint for a long time to come;
- **Then again, certain money market players may not have access to the facility.** This I still need to research;
- **In any case, the scissors effect is raggedy**. Yes, counterparties borrowed a sizeable amount over the turn. But recourse to the reverse repo facility jumped by two hundred billion dollars over the turn. Put differently, the Fed injected a small but significant amount of reserves. But that effect was completely washed out by hundreds of billions of dollars in reserves exiting the banking system to greener pastures – the reverse repo facility;
- **Then again**, the repo facility might still have prevented an undue rise in rates over the turn.

No money market meltdown

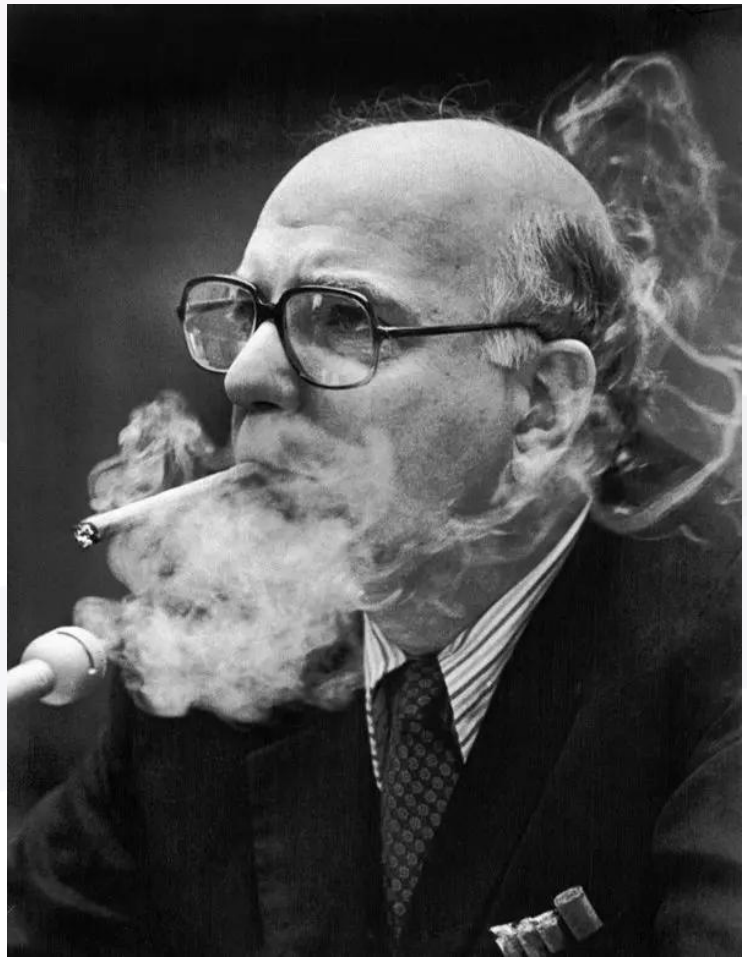
- **We can safely conclude that go-to metrics of money market tightness** – the (relative) level of reserves in the system; SOFR/fed funds versus IOR spreads; or borrowing from the Fed – point to *no* imminent spikes or strong increases in spreads (SOFR/fed funds versus IOR) outside turns. Turns *should not* trigger undue spikes in spreads either. We have the standing repo facility after all;
- **I draw the same conclusion for my simpleton measure of the concentration of bank reserves.** My proxy for the concentration of reserves is JPMorgan Chase's balance sheet. Remember, JPMorgan Chase is the biggest US bank and the most systemic bank in the annual GSIB exercise (the sole Bucket 4 bank);
- **According to JPM's Q2 quarterly earnings,** reserves (which includes a minor share of reserves at other (central) banks than the Fed) stood at USD397 billion, or 20 percent of total US bank reserves. That's essential unchanged from the 2019 level;
- **If we include the reserves JPMorgan lent against collateral,** then its share is also unchanged compared to the 2019 level;
- **Bottom line: the concentration of reserves in the US is still problematic.** But it hasn't deteriorated further.

The Unknowns

- **Of course, reserves could be scarcer than I assume**. Or become scarcer sooner than anticipated. For reasons that I am, frankly speaking, clueless about. These are the known unknowns. Then there are the 'unknown' unknowns. That's citing former US Defense Secretary Donald Rumsfeld;
- **The former includes the great stablecoin fad (I am not going to comment about the latter which are by definition unknowable).** Which are, quite simply, (mostly/lightly) unregulated money market funds. They promise their creditors – the holders of their stablecoins (a deposit in another name) – great returns. And invest in higher yielding (money market) assets. Ignore the Fintech canard, and it sounds all too familiar. Repeat after me: there is nothing new under the sun.

The stable coin run

- **We just saw that there's nothing new under the sun with stablecoins.** Or, as former Fed Chair Volcker quipped, there has been no financial innovation since the ATM was invented. True that;
- **Imagine a garden variety dash-for-cash type event hitting stablecoin issuers.** These funds will dump their assets at fire sales prices. Depositors cannot redeem their stablecoins at par;
- **Regardless, the stablecoin depositors will move their cash to too-big-to-fail banks.** That involves an interbank payment. Some bank tied up with the stablecoin issuer will soon find itself short of reserves – these type of banks are always wholesale funded and deposit-light. That will drive up money market rates. Potentially involving SOFR or even fed funds.

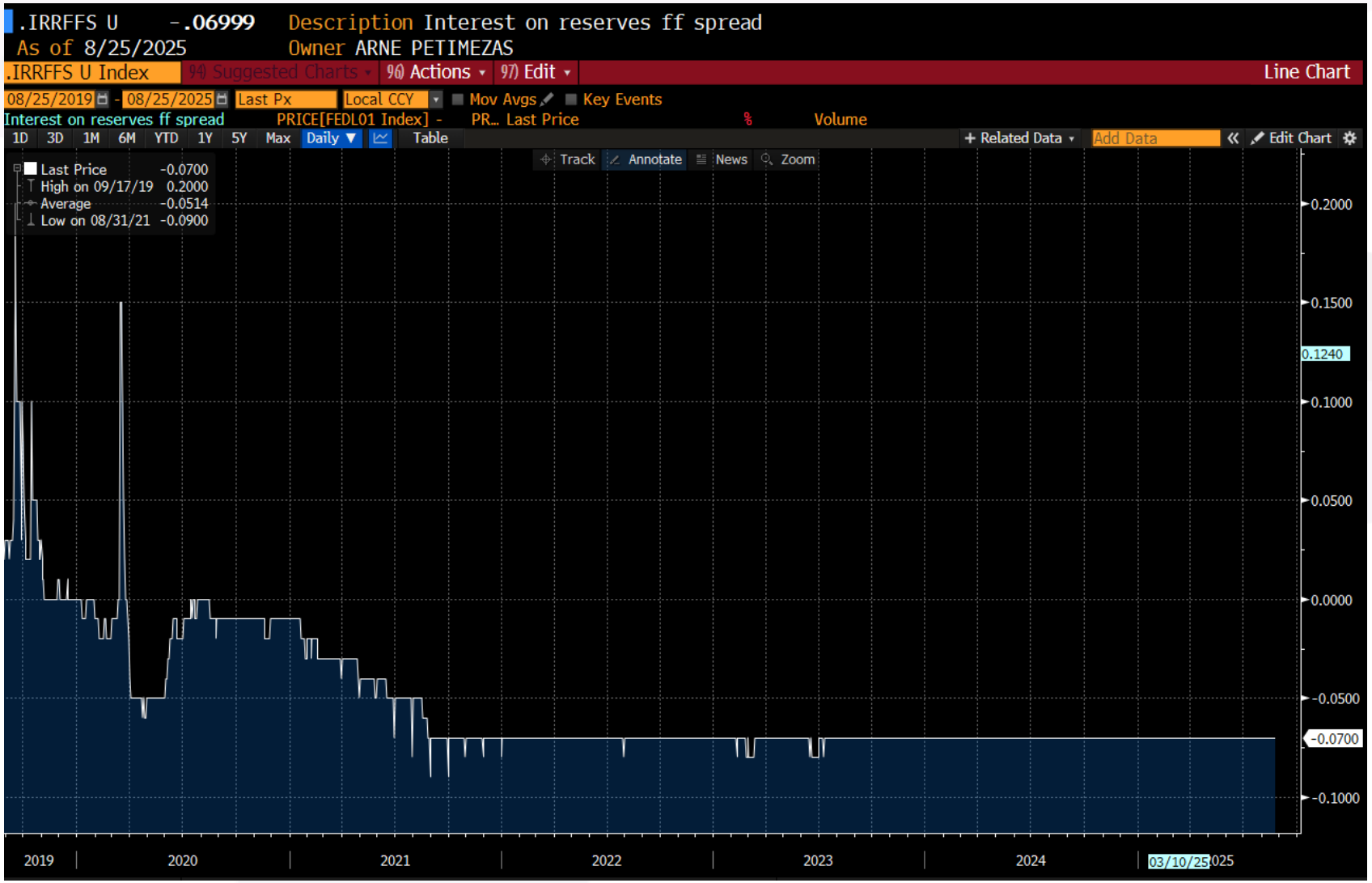


The peculiar fed funds market (1/2)

- **My final remarks are on the fed funds rate.** A peculiar rate that reflects the peculiarities of the fed funds market. The fed funds market by and large consists of foreign-owned banks borrowing reserves from Government Sponsored Entities (GSE) which cannot earn Interest on Reserves from the Fed but do have access to the reverse repo facility. In turn, the foreign banks deposit the reserves at the Fed to earn the risk-free spread. Notice how the reverse repo facility prevents even lower settlements for fed funds;
- **Foreign-owned banks are light on deposits and high on reserves**. The share of reserves in total assets/liabilities of foreign owned banks is more than forty percent. That compares with ten percent for large US banks and eight percent for small US banks;
- **Foreign banks own a large share of US bank reserves**: more than forty percent, equal to the share of large US banks;
- **The fed funds – IOR spread model is less satisfactory than the SOFR spread model**: R2 of 0.57 in the case of the latter and 0.84 in the case of the former;
- **Inputs for the fed funds model are simply unborrowed bank reserve, the reverse repo balance, and the Treasury's balance at the Fed**. I can get a better fit by substituting bank reserves with foreign bank reserve holdings relative to their total assets/liabilities (R2 0.74). However, I am unable to forecast the reserve ratio of foreign banks – too many assumptions;

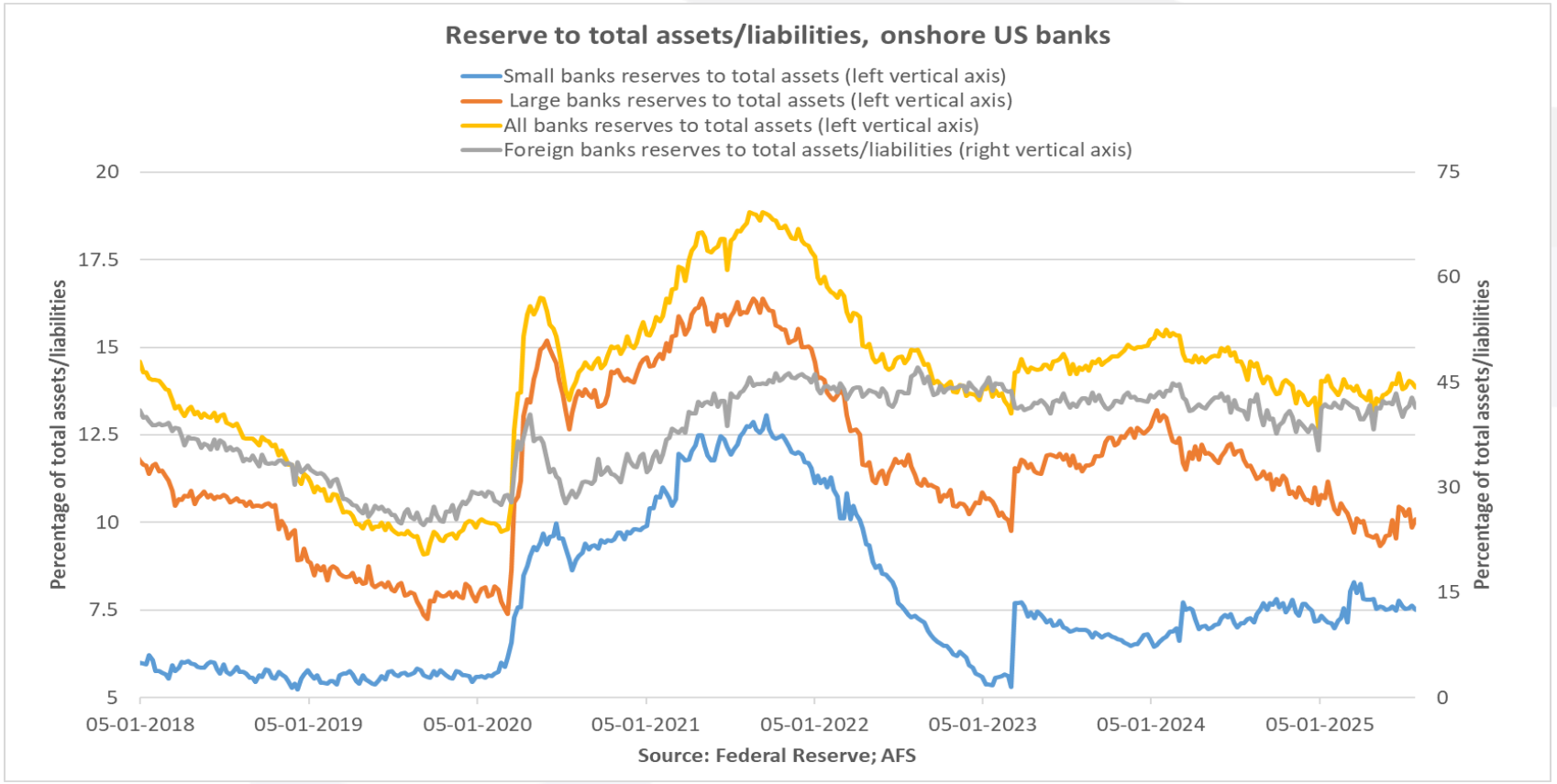
The peculiar fed funds market (2/2)

- **The fed funds – IOR spread has been stable – almost suspiciously so – since 2021:**



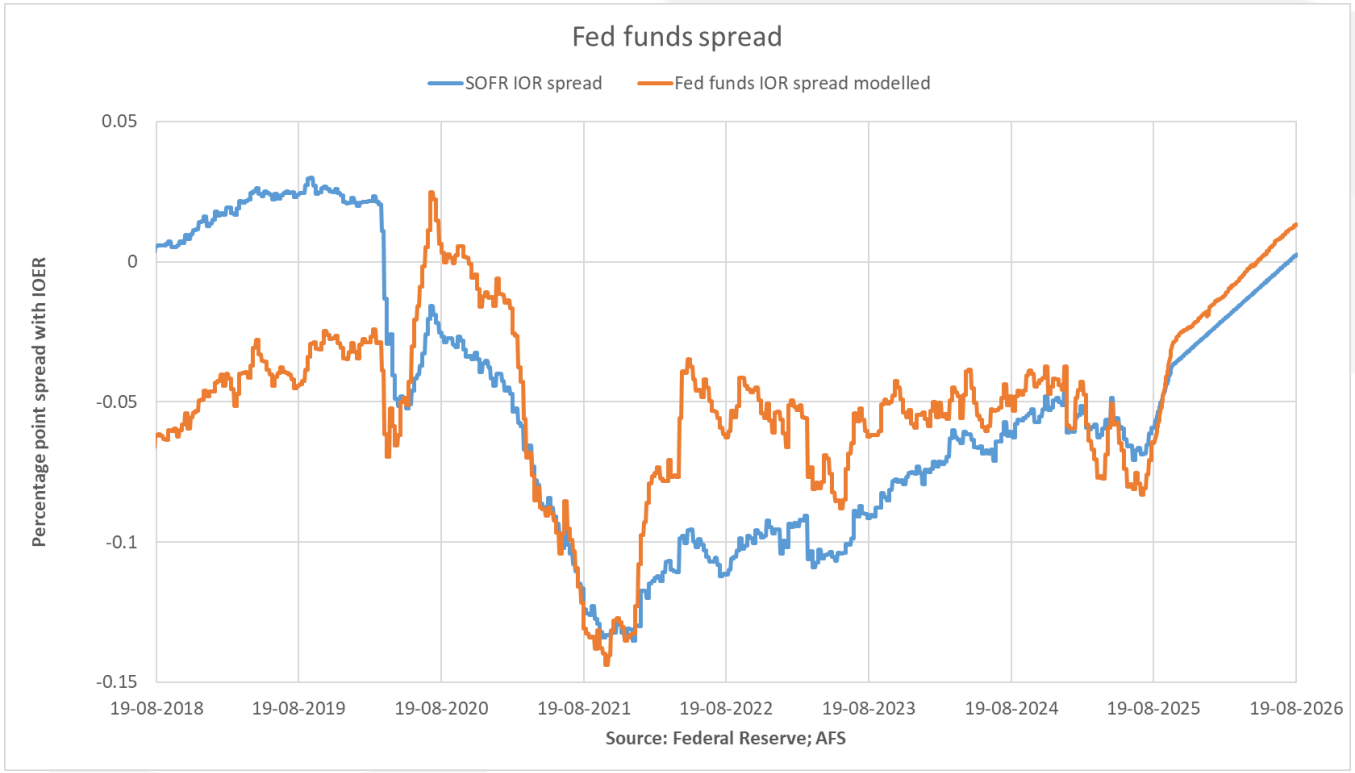
Foreign banks matter – a lot

- **The stability in the fed funs spread reflects the stable reserve ratio of foreign banks.** QE boosted the reserve ratio of domestic banks to much larger extend than that of foreign banks. Subsequent Quantitative Tightening has drained the reserves of domestic banks. Indeed, the absolute holdings of reserves of foreign banks has increased since 2022 while that of domestic banks has fallen.



Fed funds > SOFR

- **According to the model with bank reserves, the Fed reverse repo balance, and the Treasury balance with the Fed as independent variables, fed funds will settle above IOR a year from now with a slightly bigger spread than SOFR**. I find that hard to believe. In the Eurozone, a decline in reserves and ever-increasing collateral (a rise in the supply of government bonds because of persistent fiscal deficits and ECB QT) has resulted in a corresponding faster rise of secured versus unsecured rates.



SOFR > fed funds

- **Regarding the settlement of fed funds, the causality runs from the repo market to fed funds.** Reserves-rich government Sponsored Entities (GSEs) can park reserves at the Fed's reverse repo facility or lend them out in the secured market instead of placing them in the fed funds market. They will not lend unsecured in the fed funds market to foreign banks if they can get a better return elsewhere (taking the riskiness of the trade into account);
- **So, secured rates will drag secured rates higher, but only up to a point.** Foreign banks borrow reserves in the fed funds market to make an arbitrage profit. When the spread with IOR becomes too narrow, foreign banks will simply stop borrowing for arbitrage purposes. Perhaps borrowing to meet actual reserve needs will replace the arbitrage trade. Who knows.

Key takeaways (1/2)

- **We conclude our first incursion into the US money market.** A couple of takeaways:
- **The Fed's reverse repo balance will soon drop to zero**. That should not cause any problems. Money market spreads – SOFR and fed funds versus IOER – will remain well-anchored;
- **Based on the mechanics of Quantitative Tightening net of the Fed's operating losses, reserves to total assets/liabilities of the US banking system will decline to the September 2019 level by the spring of 2026.** When relative reserves become that low, money market spreads could become unanchored. Hence, the Fed could end QT around the winter or thereabout as to leave banks with a cushion of additional excess reserves;
- **After all, a confluence of events can drain reserves from the banking system and temporarily leave them with too little reserves (i.e. September 2019 levels).** Think of a quarter turn with sizeable tax payments and/or net Treasury issuance and a sudden jump in reverse repo facility recourse. Note that during the recent half year turn, the banking system lost a massive amount of reserves. Borrowing from the Fed's repo facility couldn't even come close to offsetting the loss;
- **I know I have a few readers at the ECB**. You can feel comfortably smug, and rightly so. Clearly, the Fed still has problems managing the level of bank reserves. The Fed giveth, but taketh much, more;
- **Recourse to the Fed's secured facilities (repo and reverse repo) jumping over the turn points to deep and structural frictions in the market**. Frictions that I am unable to identify yet, unfortunately.

Key takeaways (2/2)

- **A more daring Fed could push bank reserves below their September 2019 levels.** After all, my models suggest that both SOFR and fed funds versus IOR will settle below 2019 levels well into the second half of 2026. That will help with profitability, or utter lack thereof. The more the bonds roll off, the smaller the loss on corresponding reserves/reverse repos. And the greater the recourse to the profitable standing repo facility;
- **However, the models are inherently flawed.** They will likely break down in Q1 or Q2 2026, when we I think we will hit the steeper part of the demand curve for reserves. In other words, decreases in bank reserves will trigger proportionally stronger increases in SOFR versus IOR and fed funds versus IOR;
- **In any case, the Fed now has an official ceiling in place for secured rates in place: the standing repo facility.** That *should* make structural settlements above IOR impossible. However, I am not so sure about that. I have a loth of confidence in the ECB's management of its banking system liquidity. About the Fed I am not so sure though;
- **If I had to make a forecast for spreads, I would expect linear increases, with slightly stronger increases in average SOFR settlements**. The Fed will announce the end of QT at the December or January FOMC. And that will be the end of spread increases. I think the Fed will choose money market stability over profitability and the very enticing prospect of a smaller balance sheet;
- **In any case, expect more US money market updates to come**. The models need work and there's a big question mark regarding the structural frictions in the market. Stay tuned.

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