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Lost in Transmission

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There's something wrong with prices in funding and bond markets currently.

The net supply of U.S. Treasuries will increase by over $1 trillion this year, and foreign FX hedged buyers will have to buy a large portion of this supply. But the curve is currently inverted relative to hedging costs, and foreigners won't increase purchases unless the curve re-steepens relative to FX hedging costs.

The required adjustments are huge – at least 100 bps.

For the 10-year to be attractive relative to other G7 bonds on a hedged basis, yields would have to back up to at least 3.5% and more realistically to 4.0%; alternatively, three-month FX hedging costs would have to come down to 2.0%, either through positive cross-currency bases, much lower bill yields or rate cuts.

Yet markets do not expect any of this for 2019.

First, the market expects the 10-year yield to stay roughly at its current level; second, the market expects core cross-currency bases to widen, not tighten; third, the market expects Libor-OIS spreads to tighten, but only marginally; and fourth, the market does not expect either a reverse twist or rate cuts by the Fed.

If none of this will happen, the curve won't re-steepen relative to funding costs, primary dealers will continue to struggle with growing Treasury inventories and lean heavily on the o/n GC repo market to fund their inventories, which in turn will push large U.S. banks' reserve balances to the limits of their flexibility – the Fed would have to end taper prematurely and launch an o/n repo facility.

But the market does not expect that either! Something just does not add up…

We expect the Treasury curve to re-steepen relative to hedging costs this year mostly through adjustments in funding markets: through cross-currency bases trading positive, Libor-OIS reaching post-Basel III tights at 10 bps by June, and bill yields trading well below OIS – not as much due to changes in supply, but due to increased demand that will come from positive cross-currency bases.

These adjustments can of course happen without any help from the Fed. However, if the Fed chooses to aid these adjustment so it can taper for longer, the moves could be even bigger – Libor-OIS could even go negative by June.

Either way, this can be the year when the Fed, after a decade of absence, gets active in money markets again – either as a buyer of bills or a repo lender.

The U.S. fixed income market will have to deal with four uncomfortable facts in 2019:

(1) The net supply of U.S. Treasuries will increase by over $1 trillion…

(2) …and the U.S. needs foreign investors to buy a share of new supply. But…

(3) …foreign official buyers are no longer voracious buyers of Treasuries, and…

(4) …foreign private buyers are unlikely to buy either due to FX hedging costs.

Foreign investors are still important buyers of Treasuries on the margin, but the switch from foreign official accounts to foreign private accounts as dominant marginal buyers has changed the economics of funding the U.S.'s twin federal and current account deficits.

Foreign official accounts managed FX pegs and bought Treasuries to manage those pegs – at whatever cost. Because foreign official accounts were in the business of absorbing FX risk, they didn't hedge their Treasury portfolio and so didn't care about hedging costs.

Foreign private accounts are a completely different story. Foreign private accounts' mandates do not allow for much of any FX risk and so hedging costs have a big impact on whether foreign private investors buy U.S. Treasuries or other bonds available globally.

Foreign official accounts were price insensitive – it took no effort to keep them.

Foreign private accounts are price sensitive – it will take an effort to keep them.

Just as a global bank's treasurer constantly calibrates a bank's funding profile to adjust to changes in the fabric of global funding markets – whether due to money fund reform or corporate tax reform – the U.S. government should now focus more carefully on how to entice price sensitive foreign investors to fund the growing federal deficit on the margin.

New global funding arrangements suggest that the U.S. Treasury should now tweak its debt management practices and the Fed should consider new factors when setting rates: the optimal mix between bills and coupons at auctions and in the Fed's SOMA portfolio; the impact that rate hikes have on FX hedging costs and the slope of the Treasury curve relative to the slope of other core government curves globally should be taken into account when thinking about the U.S.'s funding needs – at least to some degree (also see here).[1]

But currently they aren't, and because they aren't, flows are changing. Foreign investors and even some U.S. investors have started to leave the Treasury market on the margin!

Everything that will transpire in global funding and rates markets in 2019 will come down to how long-term U.S. Treasury yields and FX hedging costs will adjust from here, such that foreign investors up their funding of the U.S.'s growing federal deficits again.

Depending on whether the adjustment comes from much higher long-term Treasury yields or much lower hedging costs means different things for risk assets and funding markets.

Sharply higher Treasury yields mean nothing good for equities and credit or the outlook.

Sharply lower hedging costs are good for risk assets, but imply a trading regime for funding markets that's very different from the trading regime of the past four years – one where cross-currency (XCCY) bases are positive, not negative, and where Libor-OIS trades tight, not wide, with a risk that Libor-OIS spreads may even go negative this year.

[1] That TBAC and the Debt Management Office of the U.S. Treasury should care about all this is clear and obvious. Whether the Fed should care about the government's funding costs and if that's consistent with its mandate is a more complex question, but we think the answer is a definite yes. We'll discuss this later, in Part IV of our analysis.

These changes would of course change banks' global issuance patterns dramatically – less issuance in dollars and more issuance in yen, euros, sterling and other currencies.

They would also re-draw the pattern of global portfolio flows – foreign investors would re-direct their flows toward the U.S. once again, at the expense of German and French government bonds, as well as Australian government bonds and Danish covered bonds.

Importantly, we do not expect spot FX rates to absorb any of the needed re-alignments, as in a world where flows are increasingly hedged on the margin, adjustments are borne by forward FX rates. That said, similar to how the spot FX rate would have to weaken for a country that needs to attract foreign buyers on the margin, in a world of hedged flows, her forward FX rates would have to weaken – and that's what positive XCCY bases mean!

This issue of Global Money Notes has five parts to it.

Part one explains why the U.S. used to be a magnet for global portfolio flows until 2017, and why the Fed's rate hikes changed that – why hikes drove capital away from the U.S., and how this flip-flop in flows changed global funding market dynamics in recent quarters.

Part two explains why traditional measures of Treasury curve inversion are meaningless in a post-Basel III world, and shows that the curve has been inverted for the past six months.

Part three explains why the Treasury curve has to re-steepen and asks whether markets should be left alone to adjust or if Treasury or the Fed should play a role in the process.

Part four explains why it's consistent with the Fed's normalization principles to help the curve re-steepen either through a reverse twist or by capping the foreign repo pool.

Part five concludes by explaining why positive cross-currency bases to U.S. dollar Libor are the most likely avenue through which the inversion will be fixed, and how structurally positive cross-currency bases would impact funding and rates market dynamics globally.

Part I – Rate Hikes and Capital Flows

Just two years ago, Japanese banks and life insurers were the main buyers of Treasuries, alongside real money accounts from other negative rate jurisdictions such as Germany, France, the Netherlands, Switzerland and a handful of smaller countries in Scandinavia.

Due to these accounts' persistent bid for Treasuries, Treasury auctions always went well, and, because their mandate did not allow for FX risks, these accounts bought Treasuries on a hedged basis.[2] As such, post-auction funding pressures typically showed up in the FX swap market – three-month cross-currency bases between the U.S. dollar and the yen, euro, Swiss franc and Scandinavian currencies were drifting more negative as the stock of Treasuries held by foreign investors grew and the associated stock of hedges that had to be rolled every three months grew too. For example, Japanese life insurers' stock of dollar hedges doubled since 2015 and rose to $1 trillion by 2017 (see Figure 1).

Widening cross-currency bases were symptomatic of a global dollar funding market where demand for dollars via FX swaps was greater than the supply of dollars via FX swaps, and the dominant arbitrage trade of the day was banks raising dollars in other funding markets on the margin to bridge that imbalance. These arbitrage trades initially pressured spreads in term unsecured markets, with three-month U.S. dollar Libor moving around the most, but after money fund reform, the funding of arbitrage trades shifted over to repo markets and collateral upgrade swaps became the main channel to source U.S. dollars (see here).

[2] Some accounts could take some FX risk, but as a rule of thumb, most foreign investors hedged most of their FX risk.

As cross-currency bases widened, more and more lenders of dollars in money markets were attracted by the spread that lending dollars via FX swaps offered over Treasury bills: several central banks and treasurers at hedge funds and asset managers changed their portfolio guidelines so they could lend dollars via FX swaps to earn this spread (see here).

This extra supply of dollars in the FX swap market brought supply more in line with demand, and as the flows became more matched, cross-currency bases stopped widening and started to tighten. Global banks' and dealers' need to bridge imbalances in order flows via arbitrage diminished, and with that came less pressure on U.S. dollar Libor and repo rates.

Figure 2 shows the three-month $/¥ cross-currency basis over time.

Like most other cross-currency bases, the three-month $/¥ basis has been grinding more and more negative during 2015 and 2016, just as Japanese real money investors' stock of hedging needs rose. It then turned sharply less negative coming into 2017, as flows in the FX swap market became more matched and the funding of arbitrage trades post-money fund reform shifted from unsecured markets to the cheaper o/n repo market.

Importantly, the backdrop to widening cross-currency bases – which lasted until 2017 – was a steep Treasury curve. Figure 3 shows that the spread between 10-year notes and three-month bills (henceforth 3s/10s) was a steep 250 basis points (bps) back in 2015 – and with that slope, the Treasury curve was the steepest core government curve globally: 3s10s spreads were 50 bps in Japan and slightly over 100 bps in Germany and France.

The Treasury curve was steep relative to all other G7 government curves and beyond: Figure 4 shows that spreads in Canada and the U.K. were 50 and 150 bps, respectively, and Figure 5 shows that 3s/10s spreads in Switzerland and Scandinavian countries were about 50 and 150 bps, respectively. The Treasury curve remained the steepest curve globally until the Fed began to accelerate rate hikes in early 2017 (more on this below).

With the Treasury curve 100-200 bps steeper than other core government curves, foreign buyers' appetite for U.S. Treasuries was understandable and, as a rule of thumb, how negative cross-currency bases traded was a good barometer of how desperate foreign investors were to dump their local currency to buy dollar assets on a hedged basis – the flatter the local curve was, the more eager local investors were to swap the low-yielding local currency for dollars, the more negative the cross-currency basis would go.

For example, with the Japanese government curve being the flattest core curve in 2015, the $/¥ basis was the most negative cross-currency basis in 2015, meaning that the desire to lend the local currency and buy dollars was strongest in Japan (see Figure 6).

German and French curves were a bit steeper than the Japanese government curve, so the €/$ basis was trading at less negative spreads than the $/¥ basis – while Europeans were desperate to get rid of euros, they were relatively less desperate than the Japanese.

The U.K. curve was steeper than either of the above curves, and correspondingly, the £/$ basis was the least negative among the core cross-currency bases back in 2015.

The acceleration of the Fed's interest rate hikes starting in 2017 changed everything.

The Fed hiked interest rates eight times for a cumulative 200 bps, which wiped out the global "slope" advantage of the Treasury curve and dramatically increased hedging costs – while in the beginning of 2017, the Treasury curve was still the steepest curve globally, by the end of 2018, it became the flattest curve globally (see Figures 3, 4 and 5 above).

Figure 7 shows the Fed's impact on FX hedging costs.[3]

[3] FX Hedging costs are not uniform across currencies. We use yen-based hedging costs as a benchmark example.

Money markets are like a cake – sponge, cream, sponge, cream…

Hedging costs are the sum of three distinct funding market components: U.S. dollar OIS, the U.S. dollar Libor-OIS spread, and the cross-currency basis to U.S. dollar Libor.[4]

During 2015 and 2016, the "frontier" in funding markets was the cross-currency basis, and, as discussed above, the widening of cross-currency bases routinely bled through to wider Libor-OIS spreads as banks tapped unsecured markets to arbitrage imbalances in the FX swap market. These "add-on" spreads – Libor-OIS and cross-currency bases – on top of U.S. dollar OIS were the dominant component of FX hedging costs back then.

During 2017 and 2018, the dynamics changed. OIS started to rise dramatically as the Fed accelerated the pace of rate hikes, and OIS became the dominant component of hedging costs. The add-on spreads had to shrink in a relative sense, as a dramatically flatter Treasury curve didn't leave much room for foreign investors to pay up for hedges.

As the Fed's interest rate hikes piled up the OIS component of hedging costs rose, the U.S. Treasury curve flattened, and, when adding hedging spreads on top of OIS (Libor-OIS and cross-currency bases to Libor), hedging costs practically converged with, and, by the end of 2018, even exceeded the 10-year Treasury yield – Treasury yields, on a hedge-adjusted basis got flat to negative relative to the abysmal local yields that Japanese and European portfolio investors have been trying to escape in the first place!

Once convergence occurred, foreign portfolio investors had no choice but to go down the global rates, credit and liquidity spectrum – they bought IG credit and CLOs in the U.S., and, to diversify away from credit, they started to buy safe, steep and cheaper to hedge core government bond curves elsewhere (for example Germany, France and Spain), but also safe, steep, and cheaper to hedge but relatively illiquid curves on the periphery (for example Australian government bonds and Danish and Swedish covered bonds).[5]

Sticking with Japanese portfolio investors as our benchmark example, Figures 8 and 9 shows the dramatic change in Japanese portfolio flows since the Fed started to hike rates. The net impact of these changing flows has been an inflexion point in the global demand for dollars in the FX swap market: less demand, not more, relative to 2015 and 2016.

Thus, just as the financial system was getting more efficient at providing dollars to the FX swap market to feed the hedging needs of foreign investors, the acceleration of hikes from 2017 onwards started to sap foreign portfolio investors' demand for dollar assets and associated dollar hedging needs. This explains why – apart from year-end turns – the $/¥ and €/$ bases have been steadily grinding tighter during the Fed's hiking cycle.

One lesson from our analysis so far is that the relative slope of core curves matters and that hedging costs matter too. Rate hikes can push the U.S. rates market in a corner if they flatten the curve and if hedging costs deter, rather than attract foreign capital flows!

One "dirty" downside of the Fed's current hiking cycle to date is that hikes have been pushing foreign portfolio flows away from the U.S. on the margin – not attracting them.

The Treasury curve going from the steepest government curve to the flattest globally had a drastic impact on the demand for Treasuries at auction and how funding markets trade.

In a remarkable contrast to two years ago, foreign buyers are routinely absent from Treasury auctions, and primary dealers are routinely stuck with Treasuries after auction, which take considerable time and effort to work through and distribute to end-investors.

[4] We can ignore the local currency funding bit of hedging costs currently, as they are static and negligible everywhere.

[5] European investors stayed home to buy local curves and Japanese investors bought European bonds using hedges.

Importantly, just as foreign investors are staging a buyer's strike, the size of auctions is getting bigger for two reasons: growing federal deficits and the Fed's balance sheet taper.

In 2018, primary dealers' inventories of Treasuries expanded by about $150 billion – which was $150 billion that the rest of the world used to buy, but currently couldn't due to hedging costs. Some of these Treasuries came from net new Treasury issuance and some from balance sheet taper. When we include the taper of the agency MBS portfolio, there is an additional $50 billion increase in dealer inventories from taper (see Figure 10).

Thus, primary dealers' inventories of Treasuries and agency MBS increased by roughly $200 billion last year, because foreign buyers, in sharp contrast to the recent past, can no longer buy these assets on a hedged basis. Primary dealers getting routinely stuck with new supply of Treasuries and agency MBS in turn changed funding market dynamics.

Two years ago, when foreign private buyers took down the bulk of Treasuries at auction, funding pressures showed up in the FX swap markets and related arbitrage activities as foreign buyers had to hedge their Treasuries back to yen, euro and other currencies.

Today, when primary dealers get routinely stuck with the bulk of Treasuries after auction, funding pressures show up in the repo market as dealers scramble to fund inventories.

This pendulum swing from Treasuries ending up mostly with end-investors funding at the three-month point in the FX swap market to Treasuries getting stuck in inventory with dealers having to fund them in the repo market is what's behind the shift in funding market dynamics in recent quarters. While it may seem odd that cross-currency bases are "asleep" while the repo market is trading stressed occasionally, that's no more odd than the Northern hemisphere braving a polar vortex while Australia is fighting serious wildfires.

What climate change is to weather patterns, curve slopes are to funding patterns…

The arbitrage trades banks are engaged in are also different from the previous regime.

Two years ago, global banks were busy deploying reserves in their HQLA portfolios to harvest deeply negative cross-currency bases, or, alternatively they tapped unsecured and secured markets to raise dollars to lend in the FX swap market on the margin (see here).

Today, global banks are busy deploying reserves from their HQLA portfolios to harvest o/n GC repo rates trading above the IOR rate as dealers scramble to fund their inventories.

Figure 11 shows a massive increase in large banks lending their excess reserves in the o/n GC repo market during the final months of 2018, which is precisely when whatever residual steepness there was left in the Treasury curve suddenly collapsed, hedging costs eclipsed the entire Treasury curve, the foreign marginal bid completely vanished, and dealers' inventories of Treasuries started to pile up as dealers became the marginal buyer.

Figure 11 is the conceptual equivalent of Figure 1 – both show surging funding needs, or more precisely, the surging funding needs of the marginal buyer of U.S. Treasuries.

Two years ago, the marginal buyer was a foreign hedged buyer whose funding needs pressured the three-month point in the FX swap market on the margin (see Figure 12).

Today, the marginal buyer is a primary dealer whose funding needs pressure the o/n point in the GC repo market on the margin. Figures 11 and 12 explain everything you need to know to understand why repo is trading stressed while cross-currency bases are "asleep".

In two years, the U.S. has gone from having the steepest government curve to having the flattest government curve; from attracting foreign portfolio flows to deflecting foreign flows; from the dollar being scarce in global funding markets, to the world swimming in dollars; from end-investors buying Treasuries at auction, to Treasuries getting stuck with dealers.

We went from a system that "flew", to a system that stalled…

Part II – Measures of Inversion

Planes stall when their nose is pulled too high – i.e., when the body of the plane "inverts".

We haven't mentioned inversion in the prior section explicitly, but a key point we've made implicitly is that the Treasury curve outright inverted during the final months of 2018 – relative to foreign investors' FX hedging costs. So much for the market's obsession of waiting for when the curve will invert, and what that inversion will mean for the outlook.

A far more important question is what inversions mean for the flow of Treasury collateral – do auctions go well or do they "stall". All else follows from there, as we will explain below.

Historically, inversions were measured by tracking the 3s/10s spread, but recently the market started to track inversions using the 2s/10s spread instead – the spread between 2-year and 10-year Treasuries. But this measure is flawed and misleading, in our view.

Historically, tracking inversions using 3s/10s had meaning to them because funding rates – Libor, repo and hedging costs – all traded at fairly tight spreads to three-month bills, and so the three-month bill yield was a reasonable proxy for investors' funding costs. In a post-Basel III financial order, however, such comparisons are largely meaningless, as effective funding costs can at times be much higher than bill yields, as shown above.

But switching from 3s/10s to 2s/10s is not a reasonable solution as no one funds at the 2-year Treasury yield, and 2s/10s says nothing about foreign demand for Treasuries, and as we've explained in the previous section, given that the U.S. is a borrower country, flows from foreign investors are imperative for the U.S. to fund its growing twin deficits.

More precisely, with foreign official demand on the wane, foreign private demand is now an important part of funding the deficits, and foreign private demand comes only on an FX hedged basis, and only if yields are right relative to FX hedging costs on the margin!

Inversions – defined as three-month hedging costs trading above the 10-year yields (henceforth "3FXs/10s") – imply that hedging costs and yields are grossly misaligned. Figure 13 shows the traditional, the new and our preferred measures of inversion, that is, 3s/10s, 2s/10s and 3FXs/10s (based on both yen and euro) spreads, respectively: while the traditional and new spread measures suggest that inversion has yet to occur, our measures show that we've been living with a curve inversion for the past four months!

The rest of this section describes how misaligned U.S. funding and capital markets currently are, and how unattractive the Treasury curve is relative to other curves globally.

Figure 14 shows the anchors of U.S. rates markets – the o/n RRP rate, the IOR rate and the top of the Fed's target range for the overnight rates complex. These anchors have gone from practically zero at the end of 2016 to as high as 2.25% - 2.50% as of today.

Figure 15 shows the OIS curve and the Treasury curve. Both curves are extremely flat – as discussed above, the Treasury curve is currently the flattest core curve globally![6]

Figure 16 shows money market (that is, funding) curves relative to capital market curves: the GC repo curve and the U.S. dollar Libor curve. The position of these curves relative to the Treasury curve actually makes traditional measures of curve flatness look even worse.

Figure 17 brings three-month FX hedging costs into the picture.

The red square shows the hedging cost of investors that swaps yen for U.S. dollars, and the blue square shows the hedging cost of investors that swaps euros for U.S. dollars.

[6] For the sake of completeness, Figure A1 in the appendix shows the swap curve alongside the Treasury curve and the asset swap curve. No matter how one looks at it, the curve is very flat in both an absolute and a relative sense.

Hedging costs are the highest for yen-based portfolio investors: at close to 3.0%, yen-based hedging costs are above the 10-year yield – the inversion we've noted above. Hedging costs are somewhat lower for euro-based portfolio investors, but only marginally.

Figure 18 draws a straight line at the current levels of three month GC repo, unsecured and yen and euro-based hedging costs across the entire term structure to show where funding costs are relative to the 10-year yield. In the lower right area, we show spreads earned by various investors that buy the 10-year and fund at various three-month points:

(1) for an asset manager forgoing the three-month bill yield the spread is 35 bps;

(2) for a bank funding at the three-month Libor rate, the spread is nil;

(3) for an investor hedging euros for dollars for three months, the spread is -5 bps;

(4) for an investor hedging yen for dollars for three months, the spread is -15 bps.

These spreads show very clearly how painfully flat the Treasury curve currently is, why no one will buy Treasuries unless the curve steepens relative to funding costs, why Treasury auctions are going so bad, and why dealers get routinely stuck with Treasuries.

First, at 35 bps, asset managers are better off buying three-month CD and CP as these instruments earn the same spread over three-month bills as the 10-year Treasury note – choosing the same amount of spread for a lot less duration risk is an absolute no-brainer.

Second, with three-month U.S. dollar Libor trading in line with the 10-year Treasury yield, its uneconomic for banks to buy Treasuries at any maturity as HQLA – this is the flipside of the case of asset managers, who currently prefer to fund banks over the government.

Third, at hedge-adjusted yields of -15 bps and -5 bps, neither yen-based, nor euro-based portfolio investors have any incentive to buy Treasuries as they earn better yields at home.

Figure 19 puts the hedge-adjusted yields of euro and yen-based investors into context.

The red line shows that by staying home in Japan, a yen-based portfolio investor buying 10-year Japanese government bonds makes 25 bps over three month Japanese bills – a Japanese investor would not buy Treasuries unless FX hedged spreads exceed 25 bps.

The blue line shows that by staying home, a euro-based portfolio investor buying the 10-year German bund can make 75 bps over three-month German government bills – this investor would not buy Treasuries unless FX hedged spreads exceed 75 bps. Using the French curve as the basis, hedged yields would have to exceed 100 bps (not shown).

But importantly, similar spread targets apply to large U.S. banks and asset managers.

Given the flatness of the Treasury curve, large U.S. banks and large asset managers' unconstrained, absolute return funds with global mandates are now doing precisely what Japanese investors have been doing for the past five years – lending the local currency, in this case the U.S. dollar, and buying European government bonds on a hedged basis!

The spread over 10-year Treasuries earned by U.S. banks and asset managers by swapping dollars for euros at the three month point and then buying 10-year bunds or French government bonds is 100 bps and 125 bps, respectively, which are 25 bps higher than the minimum spread target of euro-based investors to buy Treasuries on the margin.

These examples make it clear that given the $1 trillion in net Treasury supply this year, prohibitively high hedging costs, and more attractive core government curves elsewhere, the Treasury curve must steepen by at least 100 bps relative to funding costs for foreign and some types of domestic accounts to start buying Treasuries on the margin again.

If it doesn't, auctions could continue to go bad, dealers inventories will continue to grow, and the Fed could soon have to end taper – which we believe it just does not want to do.

Part III – The Invisible Hand

Required moves of at least 100 bps are huge in both funding and fixed income markets – they would eclipse the size of the largest Libor-OIS moves we have seen since 2015, and they would also count as one of the largest moves in the 10-year yield seen since 2015.

So we could be in for some big moves in fixed income markets in 2019…

…and perhaps moves that are bigger than that. Hedging costs or the 10-year yield moving 100 bps does not leave much margin for error: foreign inflows would stage a "sudden stop" again for a few bps less. For foreign portfolio flows to structurally "stick", hedging costs and the 10-year yield would have to adjust by more like 100 to 150 bps.

How can the curve re-steepen from here relative to hedging costs?

Within the confines of U.S. funding and fixed income markets, the required steepening can come from two and only two sources: higher Treasury yields or lower hedging costs. In turn, these adjustments can happen either through markets adjusting themselves – "the invisible hand" – or markets adjusting with some help from the U.S. government.

In this part of our analysis, we consider the scenario where markets do the adjustment, and in the next part of our analysis, we consider the scenario where the government helps.

Let's first consider how the adjustment could come from higher 10-year yields.

Figure 20 shows that the 10-year Treasury yield would have to be at least 3.50% for FX hedged buyers from Japan and Europe to consider 10-year Treasuries to be attractive relative to government bond yields available locally, given no change in FX hedging costs; the minimum yield target of large U.S. banks and funds to stay are also about the same.

As noted above, these are minimum yield targets with no room for error, and so for foreign investors and for U.S. banks and asset managers to steadily buy on the margin, the 10-year yield would have to be around 4.00% – a level it hasn't reached since 2007.

If the 10-year trades above 4.00% it probably won't mean anything good for either equities, credit or the economic outlook. The technical reasons why yields could gradually grind toward 4.00% we have discussed in the previous sections: more supply due to growing deficits and the Fed's balance sheet taper; foreign investors' buyers strike; banks unwilling to buy Treasuries outright or an asset swap at current yields for HQLA; banks buying foreign bonds on an FX hedged basis to earn a spread over Treasuries; and asset managers' current incentives to fund banks rather than the U.S. government and also to fund foreign governments on an FX hedged basis rather than the U.S. government.

In addition, primary dealers trying to move Treasuries off their books will also pressure yields higher as they cut the price of Treasuries to make room for future auctions, where they'll likely bid for paper at higher coupons to protect themselves from repo rates rising.[7]

There are also some macro reasons why the 10-year yields can move higher from here: assuming that the current IP slump bottoms during the second quarter (see here), improved indicator flows and risk sentiment can prompt the market to expect hikes again, and the Fed can turn hawkish again with a turn in risk sentiment, as the year progresses.

To be clear, we are not saying that the 10-year yield is going to 4.00%, only that forces both technical and macro could easily force it in that direction as the year progresses.

[7] Term and even o/n GC repo rates imply no to minimal carry on the inventory of Treasuries that primary dealers are currently stuck with. By bidding for Treasuries at higher coupons, dealers would protect themselves by improving the carry on their inventory given the risks that repo rates can back up and they'll have to cut prices to clear inventory.

Let's now consider the case where markets still adjust alone, but the adjustment comes not from a higher 10-year Treasury yield, but rather, lower three-month hedging costs.

Figure 21 shows that three-month FX hedging costs can be at most 2.00% for FX hedged buyers from Japan and Europe to consider 10-year Treasuries to be attractive relative to government bond yields available locally, given no change in the 10-year yield; the minimum yield limit on the dollar-lending leg of U.S. banks and asset managers that lend dollars for euros and then invest in French government bonds is also the same.

As noted above, these are maximum hedging costs with no room for error, and so for foreign investors to be back and for U.S. banks and asset managers to structurally stay, hedging costs would have to be below 2.00% – i.e., well below the Fed's target range.

If the Fed doesn't cut rates, how could hedging costs fall below the Fed's target range?

Through the cross-currency basis going positive.

There are three distinct flows can push cross-currency bases to go positive this year.

First, foreign portfolio investors' demand for dollar assets on a hedged basis has peaked, and with less demand for dollars come less negative bases (see part one above). Reduced demand comes from both less foreign inflows into dollar assets on the margin, and foreign investors selling dollar assets and buying back dollar hedges on the margin.

Second, despite the diminished demand for dollars in the FX swap market on the margin, supply remains robust as lenders of dollars care about spreads over bills, which for some types accounts – namely global banks and foreign central banks – remain significant. This ongoing lending of U.S. dollars in the face of shrinking demand has pushed the core cross-currency bases all the way to zero – with some now trading positive (see Figure 22).

Third, what can tip some bases to trade more positive from here is if the lending of dollars accelerates as U.S. banks and large asset managers lend more in the FX swap market as described above – i.e., if U.S. accounts, like Japanese banks and insurers in recent years, go from lending the local currency, in this case the dollar, on the margin to dumping it and start borrowing euros to buy steeper government curves in Europe and even Japan.

Figure 23 shows how such flows would re-shape the dynamics in the FX swap market. Thus, in 2015-2016 the backdrop was an excess demand for U.S. dollars via FX swaps which banks arbitraged by borrowing U.S. dollars secured and unsecured on the margin.

Then, in 2017-2018 the dominant theme was less demand and more lending, and so more balanced flows – a market that increasingly cleared through matched books, where banks did not have to arbitrage as much, which freed up balance sheet for repos.

Next, 2019 could be the year where U.S. banks and asset managers dumping dollars in the FX swap market to get around the flat Treasury curve tip the market to the point where there is an excess supply of U.S. dollars – the opposite of flows in 2015-2016.

If cross-currency bases go positive, arbitrage trades will be very different.

Instead of borrowing dollars in the CD and CP markets to lend into the FX swap market on the margin, banks will be borrowing in euro, yen, sterling and Swiss francs and then lend these currencies and borrow the excess U.S. dollars floating in the FX swap market.

Positive cross-currency bases would thus gradually pressure Libor-OIS to trade tighter, and as the borrowers of excess dollars look for places to invest, stressed repo markets and an excess supply of Treasury bills trading above OIS will be natural places to invest.

30 bps from positive cross-currency bases, 30 bps from a tight Libor-OIS spread and 30 bps from bill yields below OIS as arbitrageurs buy bills to invest excess U.S. dollars – these are the forces that together can easily push hedging costs 100 bps lower this year.

Part IV – Inversion and the Room to Taper

Clearly, markets are able to adjust on their own, and some of these "healing" flows are already in train: cross-currency bases are breaking through the zero line with some trading positive already; three-month U.S. dollar Libor-OIS spreads have come in on the margin; persistent flows from Japan and lately also from the U.S. have been pushing the yield on 10-year French government bonds lower; and large U.K. banks harvesting a positive sterling cross-currency basis have been lending into the stressed repo market in the U.S. as a part of a trade where they soak up excess U.S. dollars in the sterling swap market.

Figure 24 shows the constellation of curves when misalignments were at the peak.

Figure 25 shows the constellation of curves today – the market is adjusting as we speak.

So far so good, but which of the two scenarios will dominate the remainder of the year?

Of the two macro scenarios discussed above, its better for risk assets and the outlook if hedging costs trade down to 2.0% than if the 10-year Treasury yield trades up to 4.0% – it is better if the curve bull steepens rather than bear steepens relative to hedging costs.

Why a macro investor should care about which of these scenarios will dominate is clear, but should the U.S. government – either the Treasury, or the Fed, or both – also care?

We think the answer is yes.

First, Treasury should prefer funding strategies that lower the government's funding costs, and in the current environment issuing fewer bills and more coupons would do just that: it would steepen the curve relative to hedging costs and raise the odds that the curve re-steepens the right way from the perspective of the Treasury – i.e., that the adjustment would come mostly from lower FX hedging costs, rather than higher long-term yields.

Historically, bill yields always traded about 30 bps below OIS, but recently they've been trading north of OIS. This is due to the massive supply of bills that was issued in 2018 under the assumption that we still suffer from a bill shortage. This assumption is wrong: the world now suffers from a glut of bills (see here), which contributes to hedging costs being much higher than necessary and the curve being inverted relative to hedging costs. Lower bill yields from less issuance would mean more lending in the FX swap market on the margin, which would help push cross-currency bases trade positive (see above).

Why the sovereign should shift issuance away from bills toward coupons is thus obvious: if she doesn't, the flatness of the curve will worsen and funding can get more expensive.

Second, the Fed should also care about the flatness of the Treasury curve for it affects how much room it has to taper and how soon it will have to launch an o/n repo facility.

As discussed in part one of our analysis, primary dealers' inventories have increased by $200 billion since mid-2018, due to increased federal deficits and taper (see Figure 10).

Most of this increase in dealer inventories was funded by large U.S. banks swapping reserves for o/n repos in HQLA portfolios on the margin, and at rates well north of IOR.

According to their fourth quarter financials, J.P Morgan Chase Bank and Bank of America were the only two banks that lent into dealers' increased funding needs on the margin, which shows that the repo market currently relies on two banks to clear (see Figure 26).

This is important to appreciate because it implies that there is a fine balance between the size of primary dealer's inventories of Treasuries and these two banks reserve balances – once these two banks lose their flexibility to toggle between reserves and o/n repo freely, the repo market could lose its lenders of next-to-last resort, primary dealers would scramble to fund their inventories and o/n rates would drift outside the Fed's target band.

The Fed would have no choice but to suddenly end taper and launch an o/n repo facility – which we believe it doesn't want to.

The Fed should thus care about the slope of the curve as it impacts the room to taper.

A flat curve means no interest in Treasuries, growing inventories, growing repo pressures, and large U.S. banks' reserve balances being pushed to the limits of their flexibility.

A steep curve means that auctions go well, dealer inventories clear and that pressures in o/n markets – the markets which ultimately determine the room to taper – disappear.

What can the Fed do to maximize the scope of balance sheet taper and delay the launch of a fixed-price, full-allotment o/n repo facility? What a pilot does when a airplane stalls.

When an airplane stalls you push its nose down…

…so that the airplane goes faster and more air flows over the wings which helps create enough lift for the plane to start flying again. The same with the flow of Treasury collateral.

Like with an airplane in deep stall, the best course of action for the Fed is to push down the nose of the U.S. rates complex – three-month funding rates – and push it down hard.

The Fed can do one of three adjustments, in our view:

(1) reverse twist the SOMA portfolio,

(2) cap the foreign RRP facility, or

(3) cut interest rates.

First, a reverse twist would steepen the curve and enhance the flow of Treasury collateral similar to the way Treasury issuing fewer bills and more coupons would (see above). Lower bill yields from a reverse twist would mean more lending in the FX swap market on the margin, which would help push cross-currency bases trade positive (see above).

Second, capping the foreign RRP facility would force $250 billion worth of FX reserves currently on deposit at the Fed to flood into the bill market and/or the FX swap market – flows that big would push cross-currency bases go very positive, very fast, which would accelerate the adjustment process we discussed in the previous section (see Figure 27).

Why the Fed should seriously consider options number one and two if it does not want to cut rates is clear: implicit in our analysis is that whatever force keeps the yield curve flat, from a plumbing perspective, the Fed overdid the hiking cycle by about two or three hikes!

The nose of the plane got pulled too high.

The plane stalled.

The plane stalled, because the importance effective funding rates like FX hedging costs and spreads to OIS were ignored – see From Exorbitant Privilege to Existential Trilemma – as was the shift from funding the U.S with price insensitive to price sensitive buyers.

To be clear, we are not saying that the amount of rate hikes to date was incorrect – they are wholly consistent with the performance of the economy and the dual mandate.

What we're saying is that from a plumbing perspective, hikes led to an aerodynamic stall: rate hikes pushed hedging costs too high and flattened the Treasury curve too much relative to other core curves. From a plumbing perspective the Fed hiked a little too much.

The system is constantly evolving and central banks must evolve too.

Some of the new things the Fed should consider when setting rates are these very topics. Balancing rate hikes, politics and the dual mandate was never easy, but it was necessary. Balancing taper versus global curve slopes won't be easy either, but it will be necessary.

Conclusions – The Path of Least Resistance

What will be the most likely path of adjustment?

Despite the arguments in our analysis as for why Treasury should adjust its approach to debt management and why the Fed should reverse twist and cap the foreign repo facility, we do not expect either Treasury or the Fed to announce any changes on these fronts.

The reason why we do not expect any change from either institution is because bill supply will be down during the first half of 2019, which should drive yields marginally lower, cross-currency bases marginally more positive, and Libor-OIS marginally tighter. Both the Treasury and the Fed are slow-moving institutions that like to wait and see, and they will wait and see how the marginal reduction in bill supply works its way through the system.

This means that during the first half of the year, the bulk of the adjustments will have to come either from higher yields or cross-currency bases to U.S. dollar Libor going positive.

Higher yields are unlikely as the global IP cycle will trough during the second quarter, which means the market won't discount rate hikes and the Fed won't turn more hawkish before the second half of 2019, in our view (see our House View on interest rates here).

That leaves positive cross-currency bases as the path of least resistance…

The three-month €/$ cross-currency basis trading positive this year will be a key piece of the puzzle of how the U.S. Treasury curve will re-steepen relative to European curves.

Just as a negative cross-currency basis served as the "equalizer" of global curve slopes when the Treasury curve was the steepest curve globally (see part one of our analysis), a positive basis will serve as the equalizer now that it is curve is the flattest globally.

Positive cross-currency bases are not unicorns…

…the £/$ basis has been trading positive since 2018 and the Swiss franc/$ basis has recently turned positive too. More and more bases going positive means more issuance in sterling, Swiss franc and euro and less issuance in dollars, which means less pressure on U.S. dollar Libor-OIS spreads. If we are right, and the Treasury curve will re-steepen mostly through cross-currency bases going positive, then U.S. dollar Libor-OIS spreads can go as tight as 10 bps by June, which is 15 bps tighter than what the market expects.

Positive cross-currency bases and tighter Libor-OIS spreads come with lower bill yields as the borrowers of excess supply of dollars in the FX swap market look for a place to invest, much like the borrowers of excess yen and euro looked for places to invest two years ago.

Whether these adjustments will lower hedging costs by the required 100 bps fast enough for primary dealer inventories to clear as Treasury supply gathers pace is the big question.

If they don't, o/n repo rates could continue to trade stressed and the Fed will be forced to end taper early and will soon have to launch a fixed-price, full allotment o/n repo facility.

If the Fed doesn't want that, it will have to accelerate these adjustments and push the "nose of the plane down" – either via a reverse twist or by capping the foreign repo pool. Either would push bill yields much lower, cross-currency bases much more positive and Libor-OIS much tighter than before – under this scenario our Libor-OIS target is -5 bps.

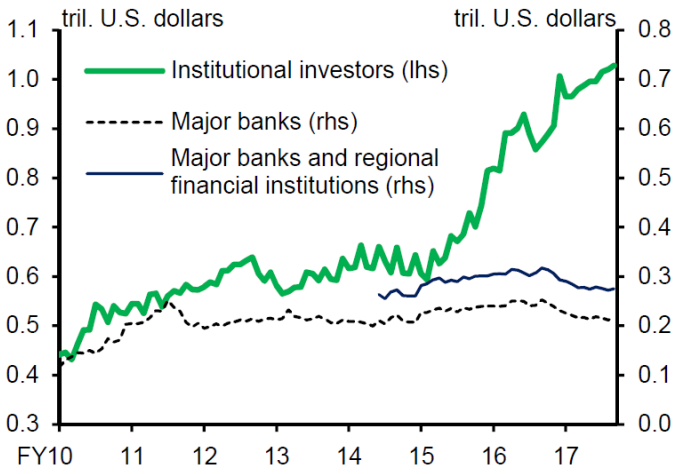
Either of these outcomes suggests that after a decade of absence, this is the year when the Fed will become an active lender in o/n repo markets and/or an active buyer of bills.

And what a difference a decade makes…

…we went from a Fed that had to buy Treasuries on the long-end to support risk assets, to a Fed that now has to buy bills on the front-end to support Treasuries on the long end.

Figure 1: Japanese Investors' Stock of U.S. Dollar FX Hedges

$ trillions, data through September 30, 2017

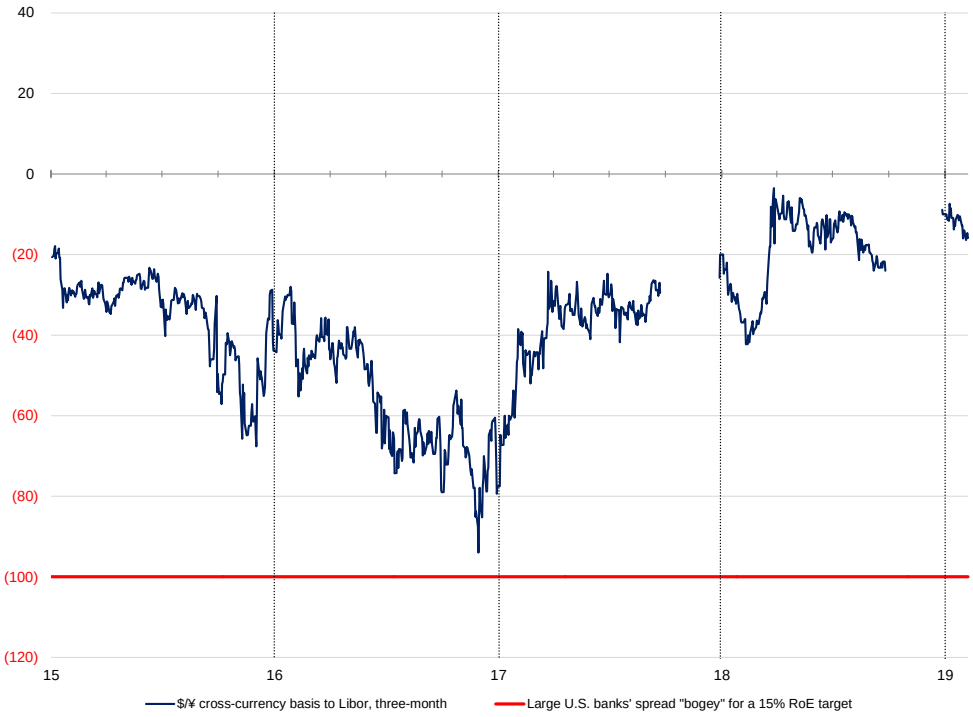


Note: 1. "Institutional investors" covers Japan Post Bank, the Norinchukin Bank, Shinkin Central Bank (from end-September 2014), and life insurance companies (members of the Life Insurance Association of Japan). The data from end-September 2017 for the life insurance companies are estimated based on the data for nine major insurance companies.
2. Latest data as at end-December 2017.
Source: Bloomberg; The Life Insurance Association of Japan; published accounts of each company; BOJ.

Source: Bank of Japan

Figure 2: From Imbalanced Flows to More Balanced Flows

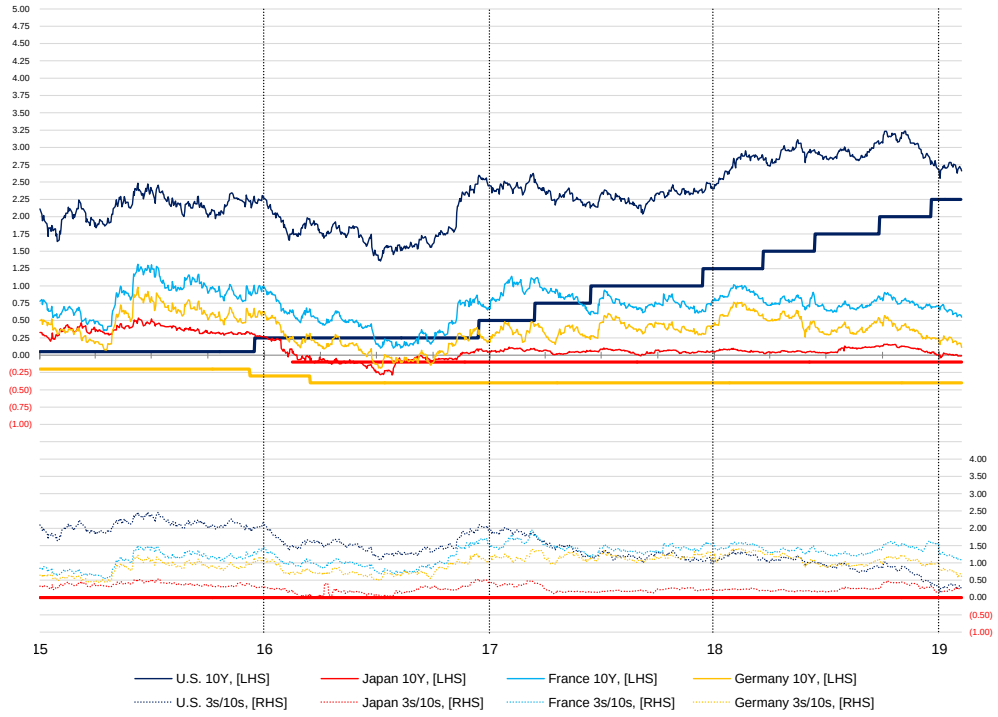
Basis points, excluding the 2017 and 2018 year-end turns to emphasize trends



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 3: The Relative Slope of Treasuries vs. Core G7 Curves

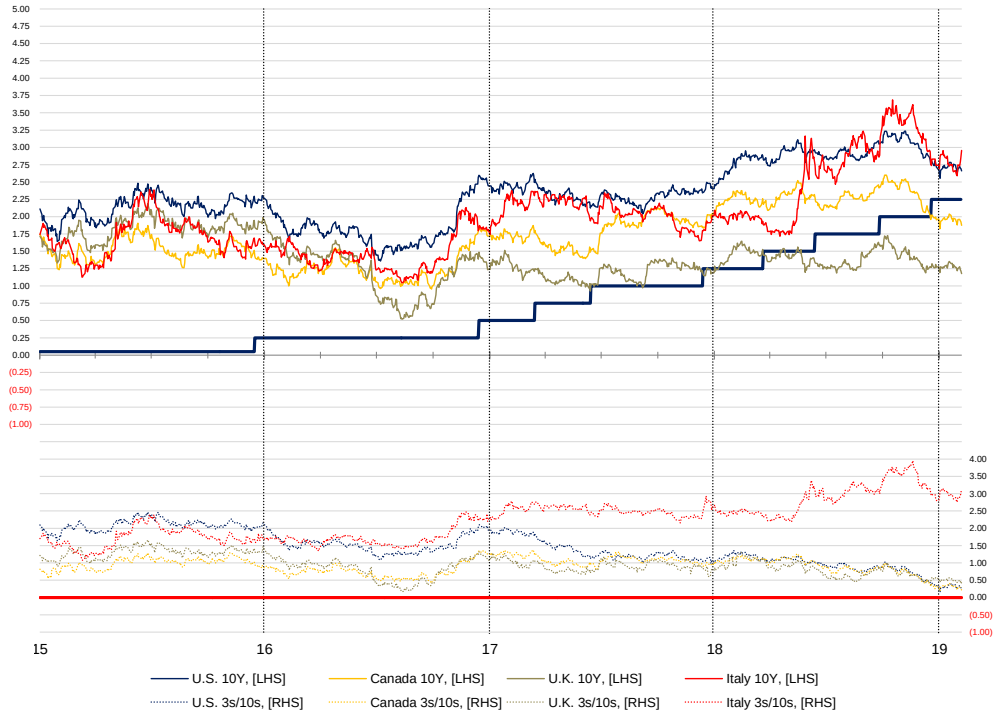
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

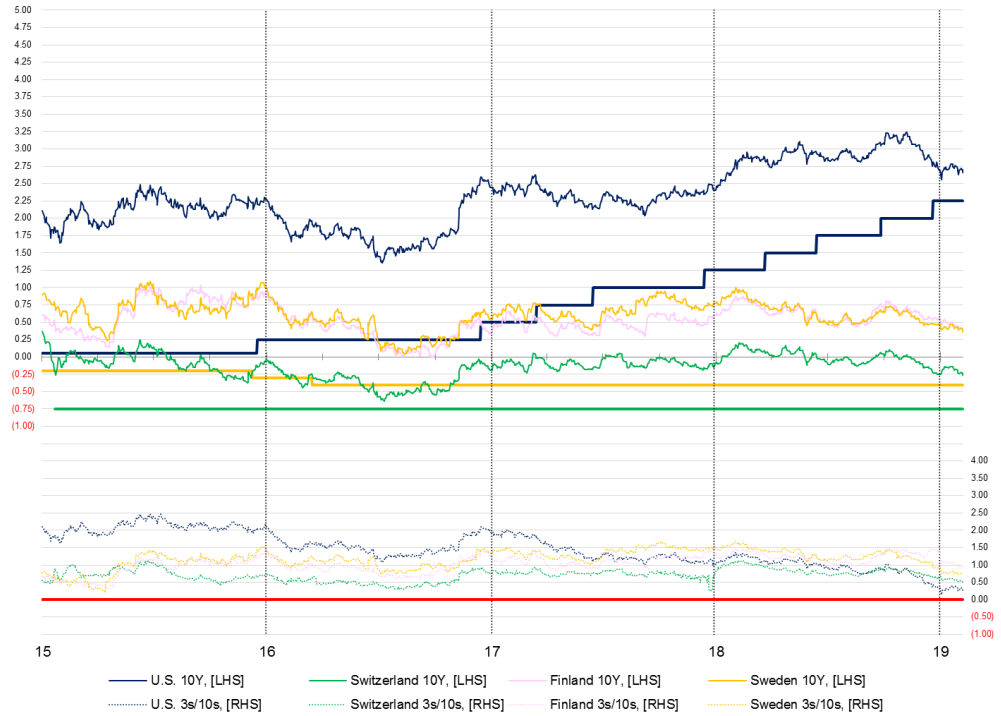
Figure 4: The Relative Slope of Treasuries vs. "Peripheral" G7 Curves

percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

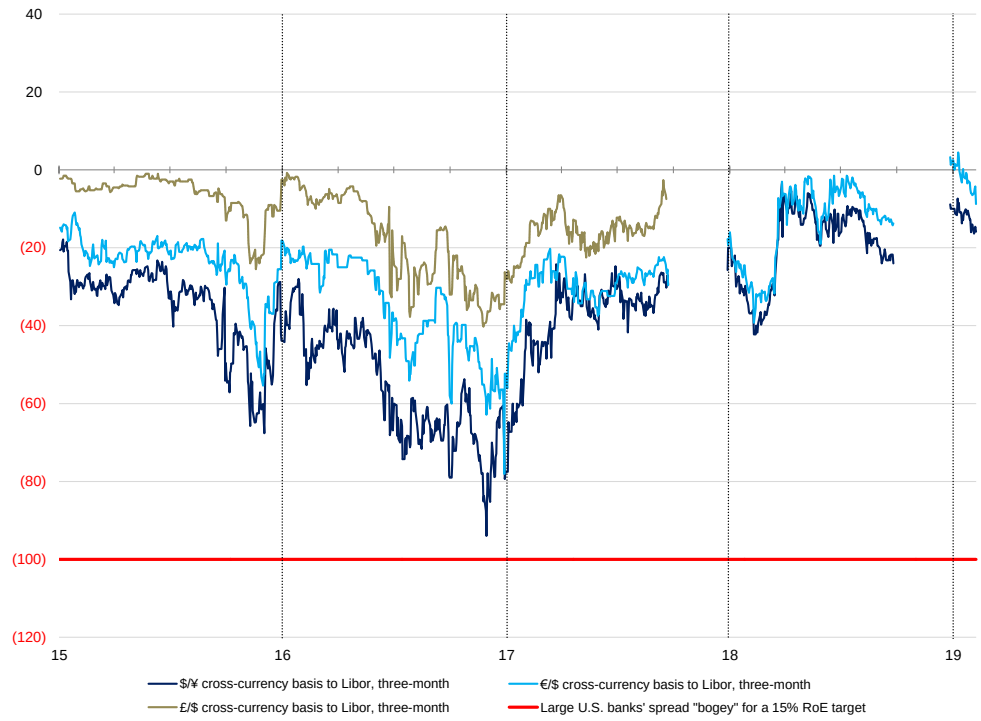
Figure 5: The Relative Slope of Treasuries Beyond G7 Curves



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 6: The Flatter the Curve, the Wider the Basis

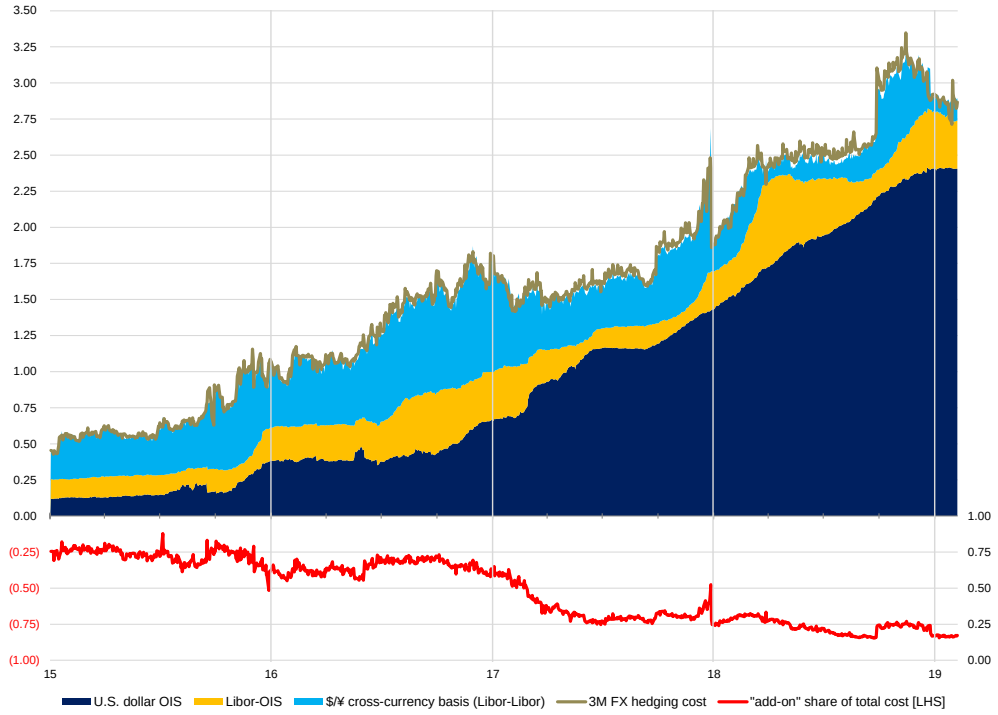
Basis points, excluding the 2017 and 2018 year-end turns to emphasize trends



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 7: Money Markets are Like a Cake

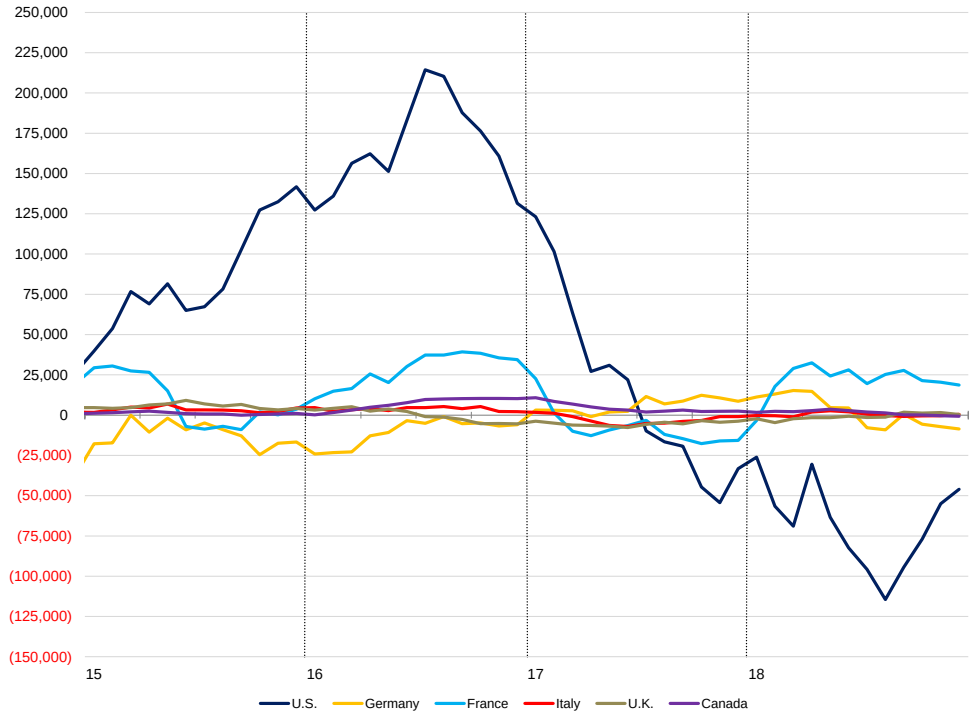
Percent [LHS], percent share [RHS]



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 8: Relative Curve Slopes Drive Portfolio Flows (1)

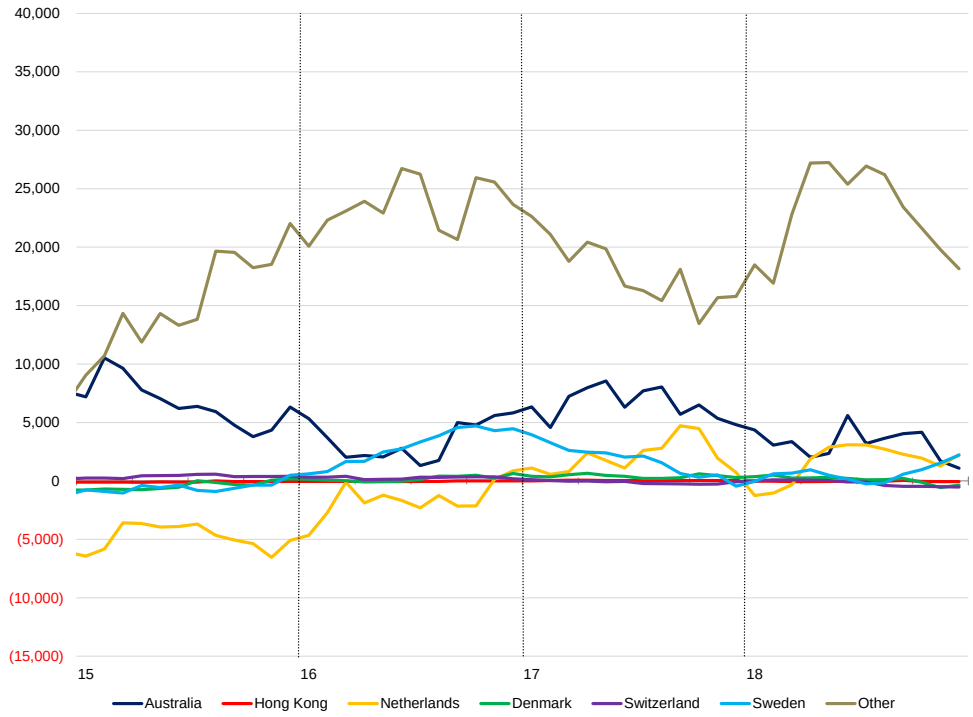
¥ 100 millions, 12-month moving sum, sovereign bond investments only



Source: Credit Suisse, Ministry of Finance of Japan, the BLOOMBERG PROFESSIONAL™ service

Figure 9: Relative Curve Slopes Drive Portfolio Flows (2)

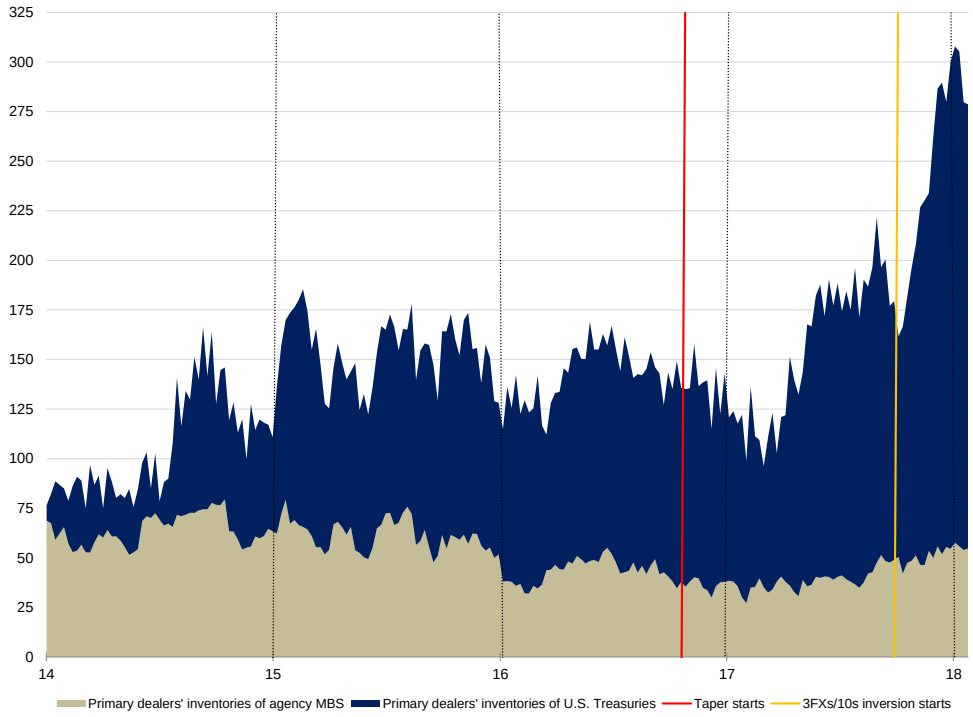
¥ 100 millions, 12-month moving sum, sovereign bond investments only



Source: Credit Suisse, Ministry of Finance of Japan, the BLOOMBERG PROFESSIONAL™ service

Figure 10: The Collateral Chokehold

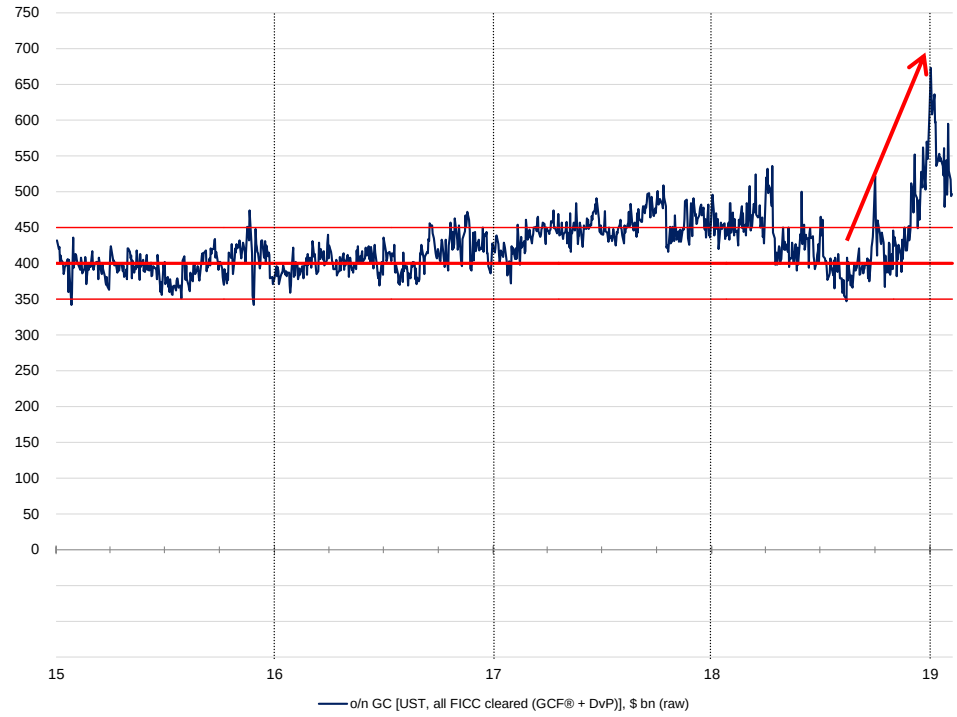
$ billions



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 11: Large U.S. Banks Fill Primary Dealers' Funding Needs

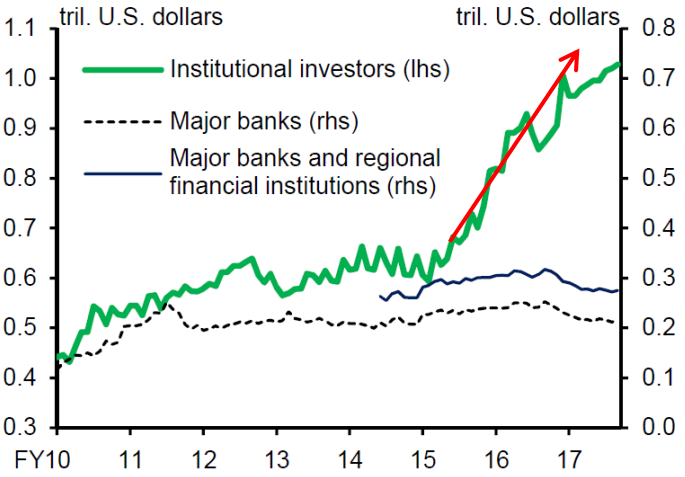
$ billions



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 12: From Term FX Swaps to o/n GC Repos

$ trillions, data through September 30, 2017

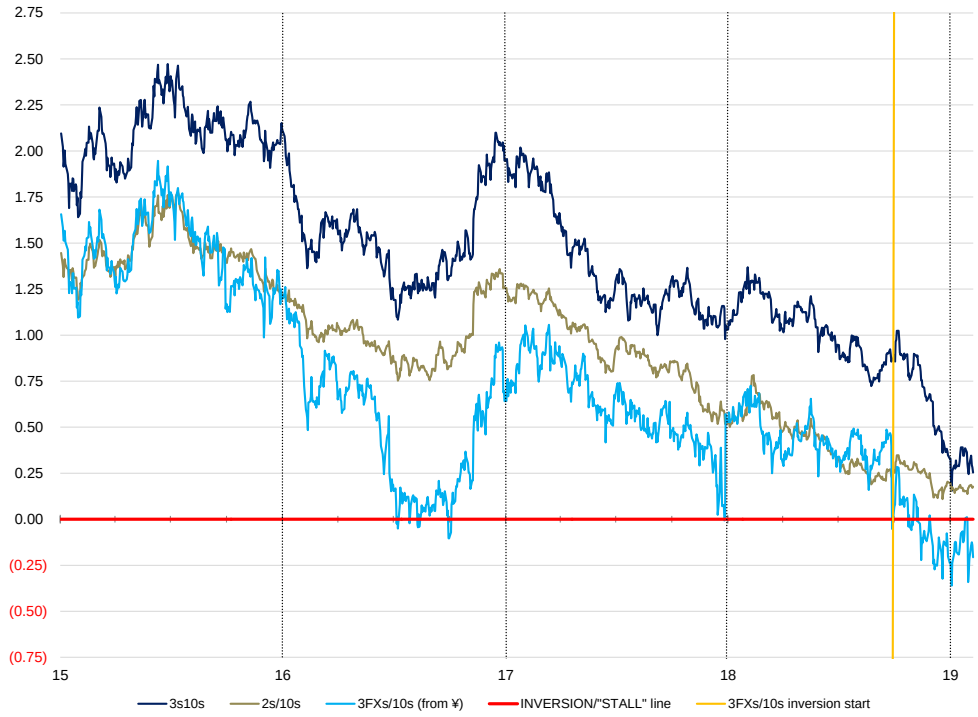


Note: 1. "Institutional investors" covers Japan Post Bank, the Norinchukin Bank, Shinkin Central Bank (from end-September 2014), and life insurance companies (members of the Life Insurance Association of Japan). The data from end-September 2017 for the life insurance companies are estimated based on the data for nine major insurance companies.
2. Latest data as at end-December 2017.
Source: Bloomberg; The Life Insurance Association of Japan; published accounts of each company; BOJ.

Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 13: The Curve Has Inverted

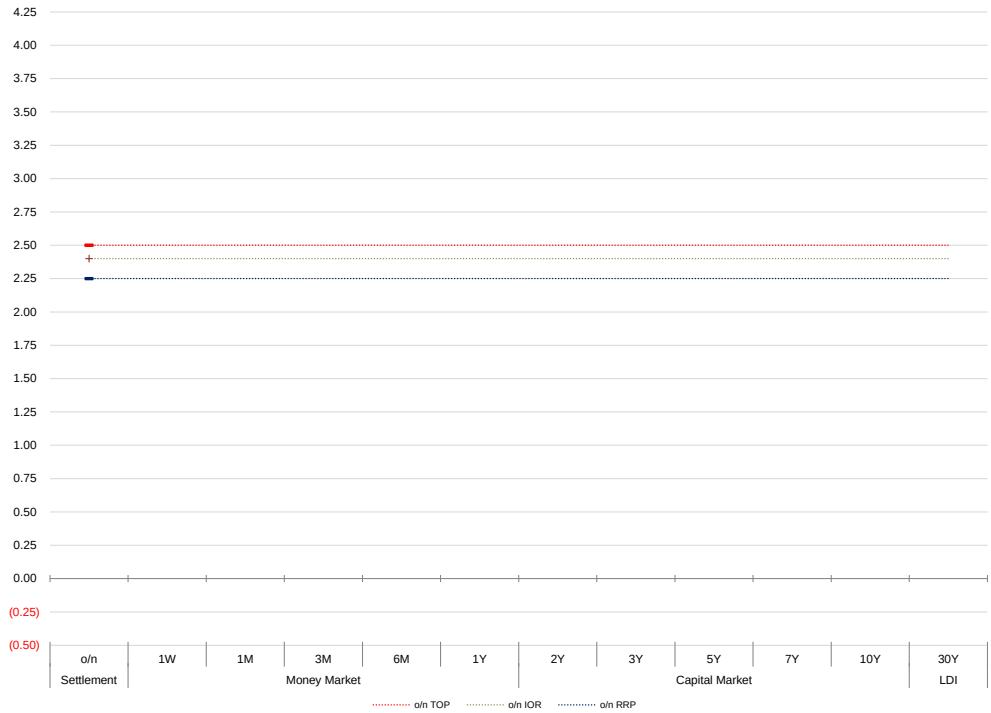
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 14: The Anchors

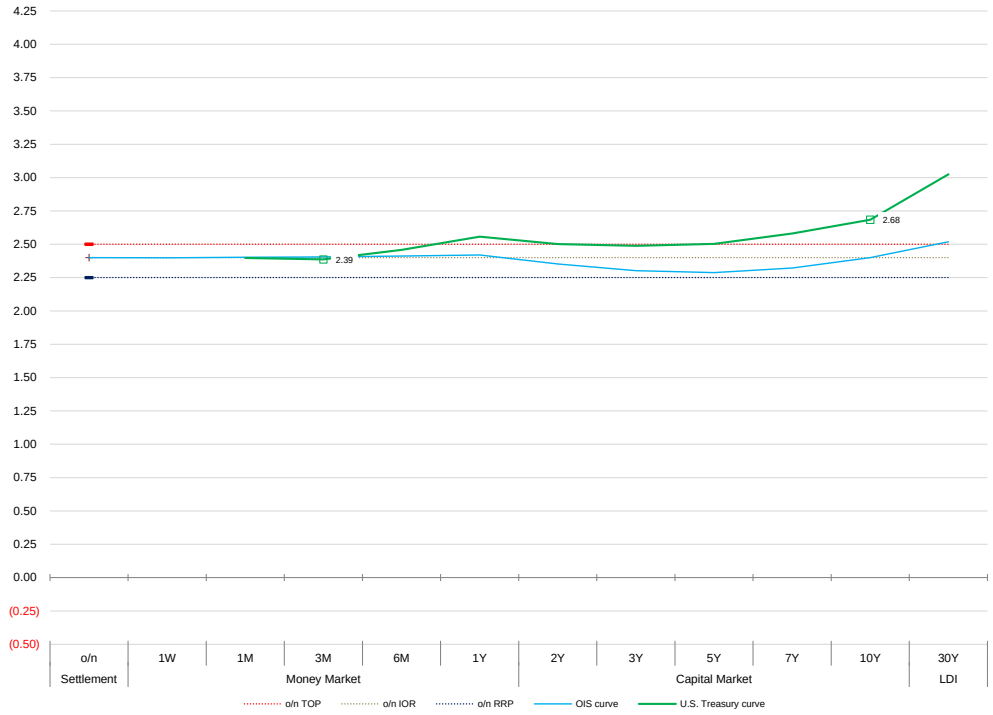
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 15: The Curve Is Flat

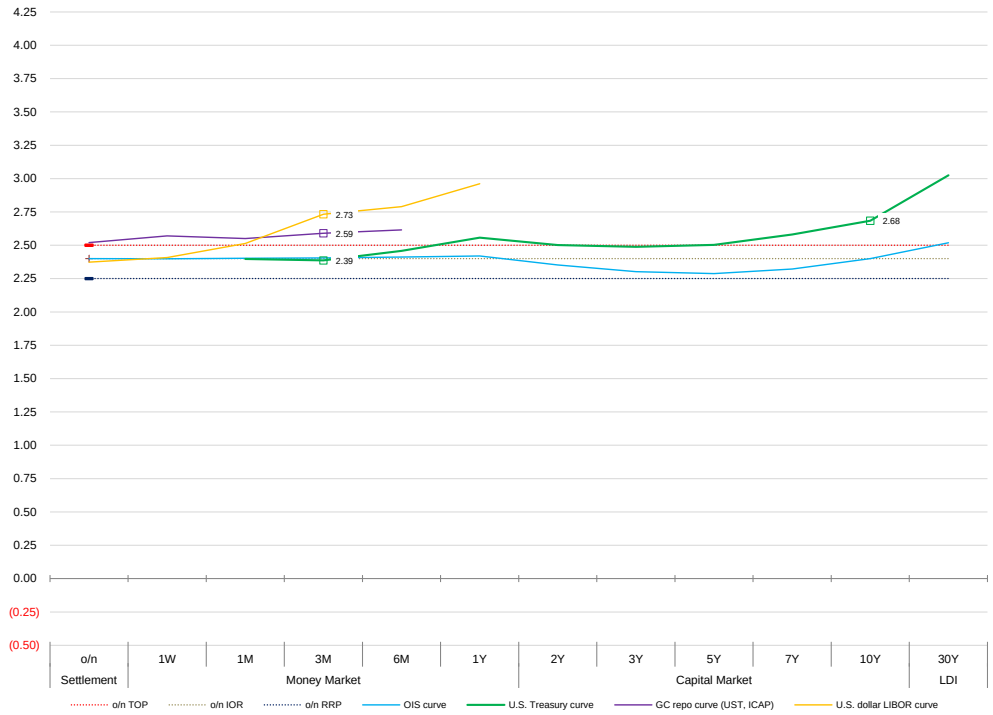
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 16: The Curve Is Even Flatter Relative to Funding Costs

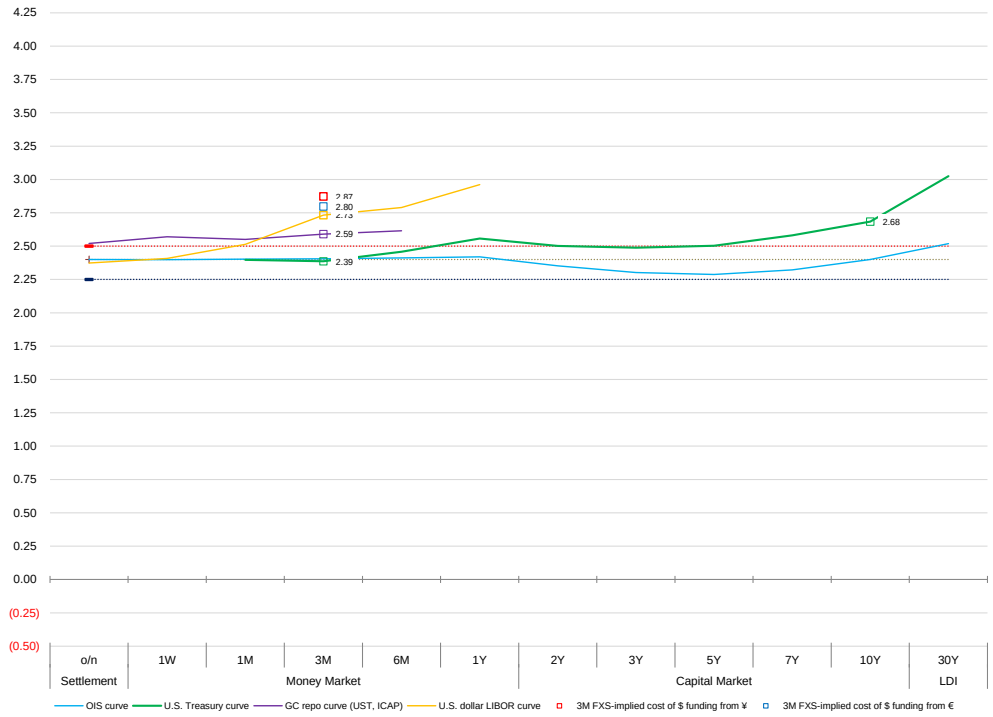
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 17: Prohibitive FX Hedging Costs

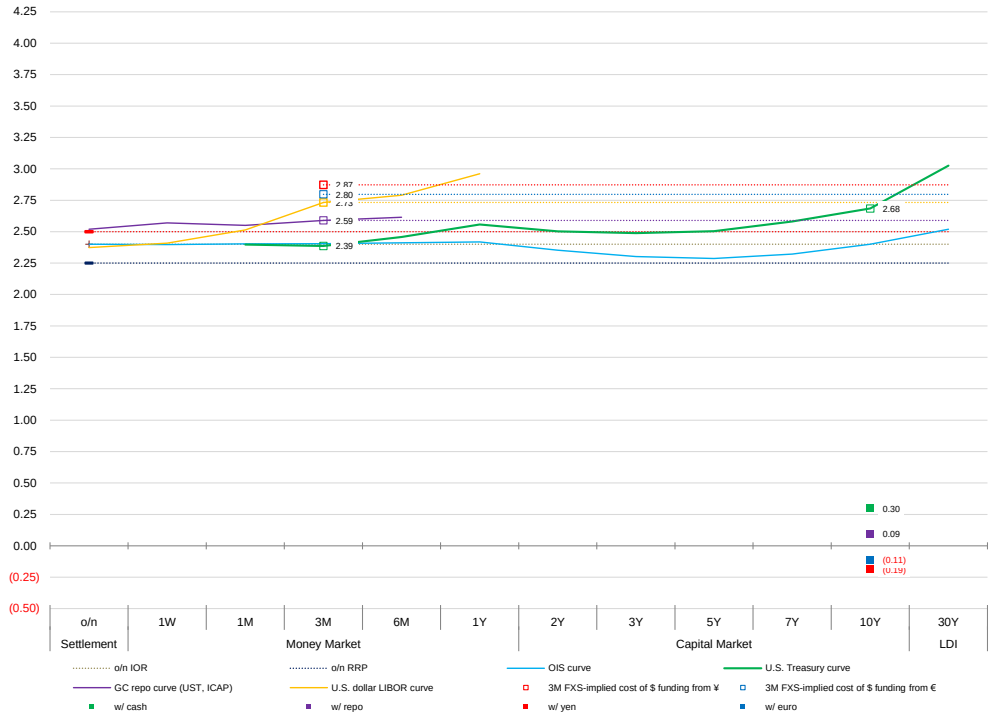
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 18: Carry Makes the World Go 'Round – Or Not…

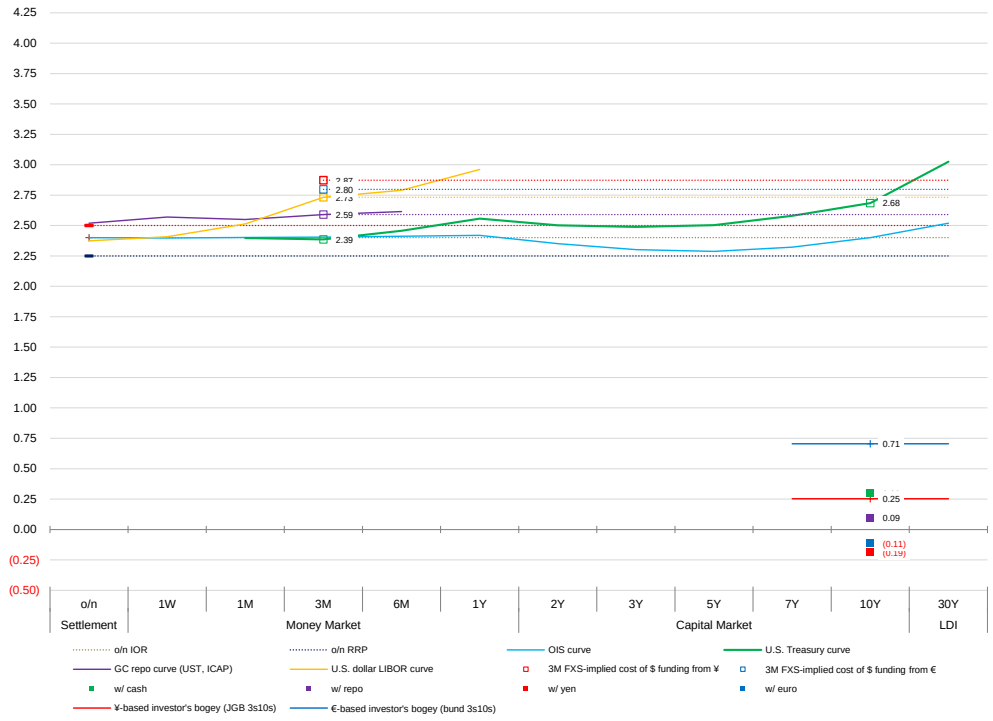
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 19: Foreign Hedged Investors' Minimum Spread Targets

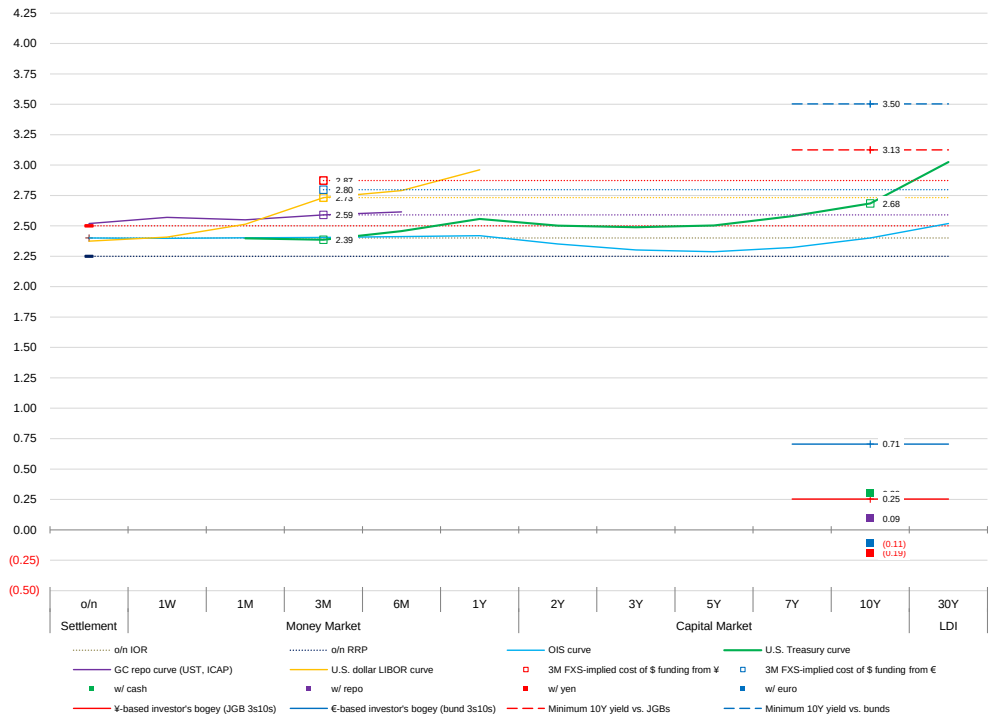
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 20: The Minimum Yield Target

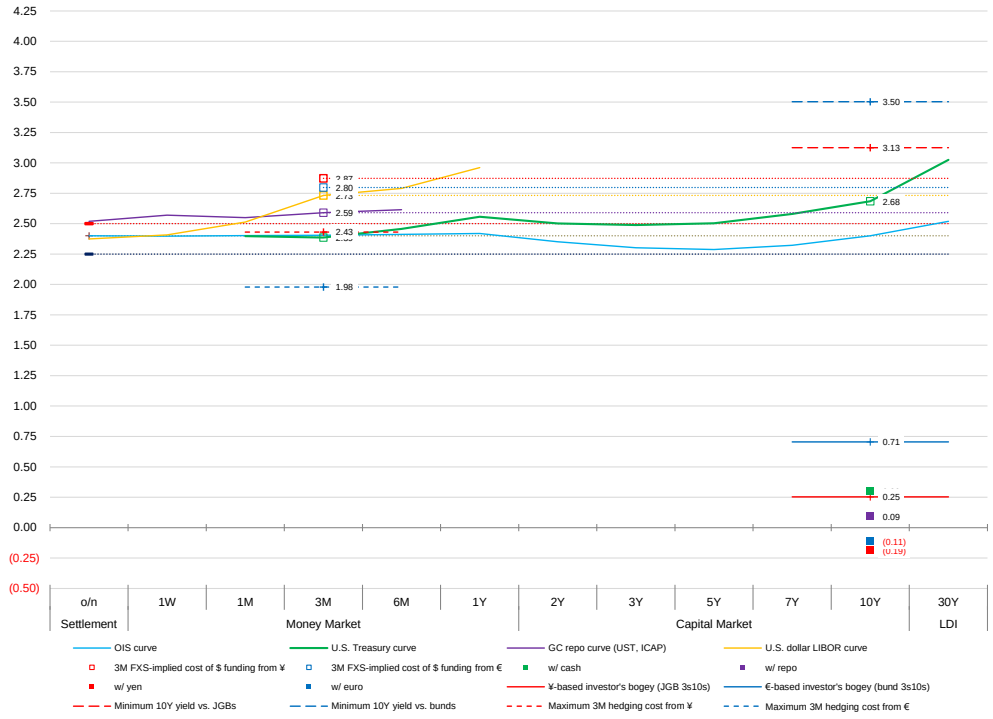
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 21: The Maximum Hedging Cost

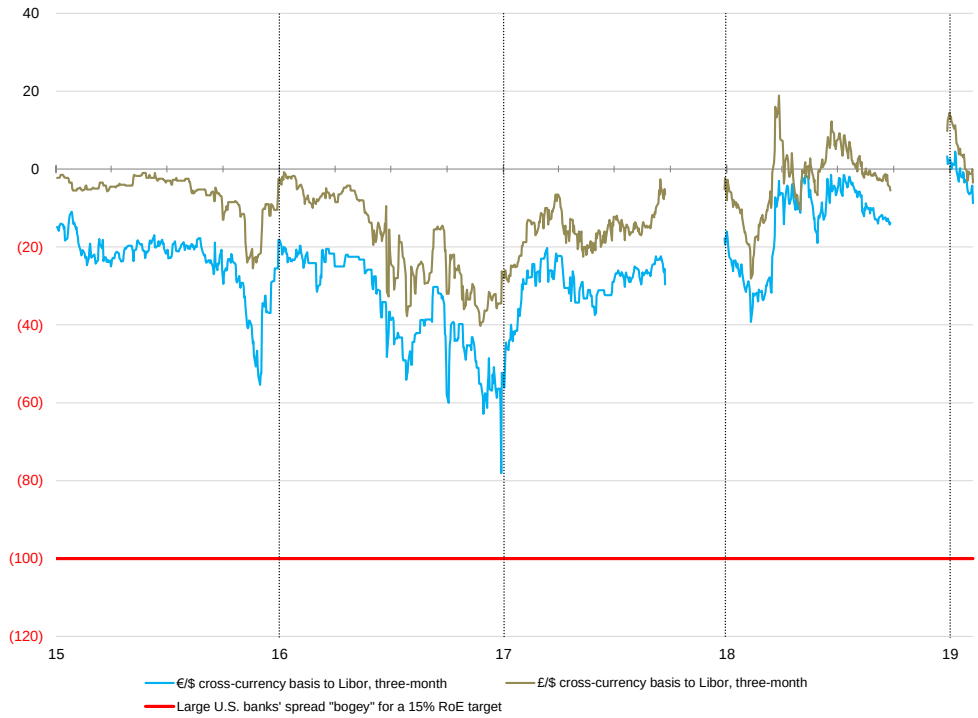
percent



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

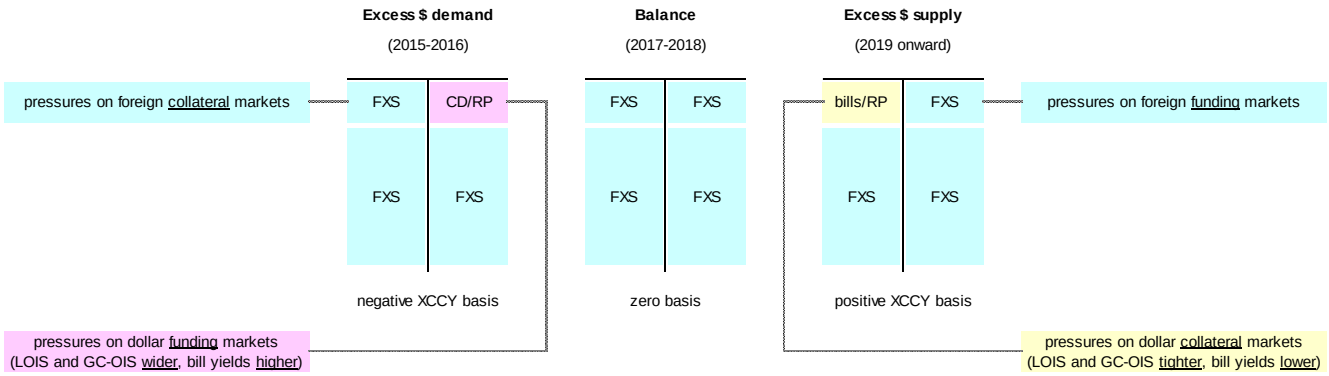
Figure 22: Do You Believe in Unicorns?

Basis points, excluding the 2017 and 2018 year-end turns to emphasize trends



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

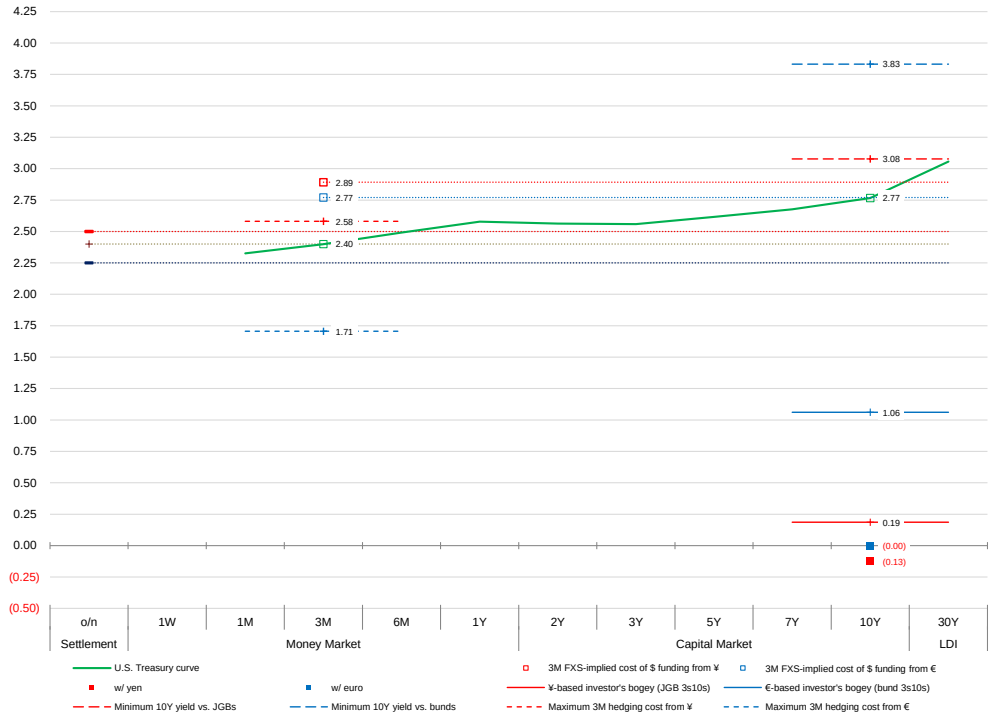
Figure 23: Tipping the Balance



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 24: Peak "Stall"

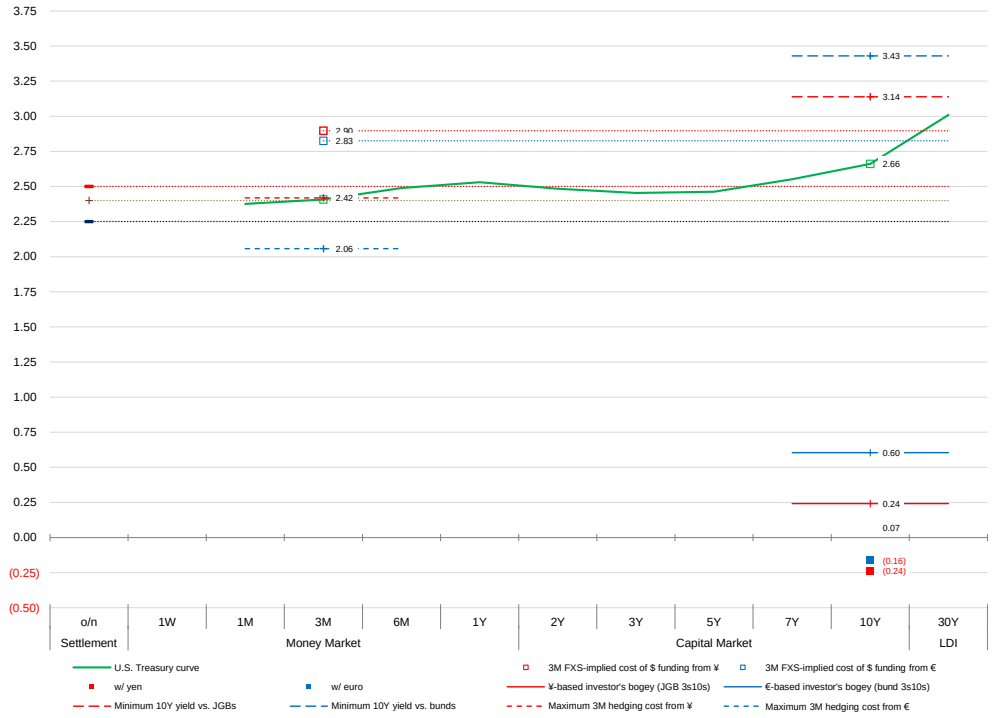
Percent, as of December 27th, 2018



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 25: The Market Is Adjusting Already

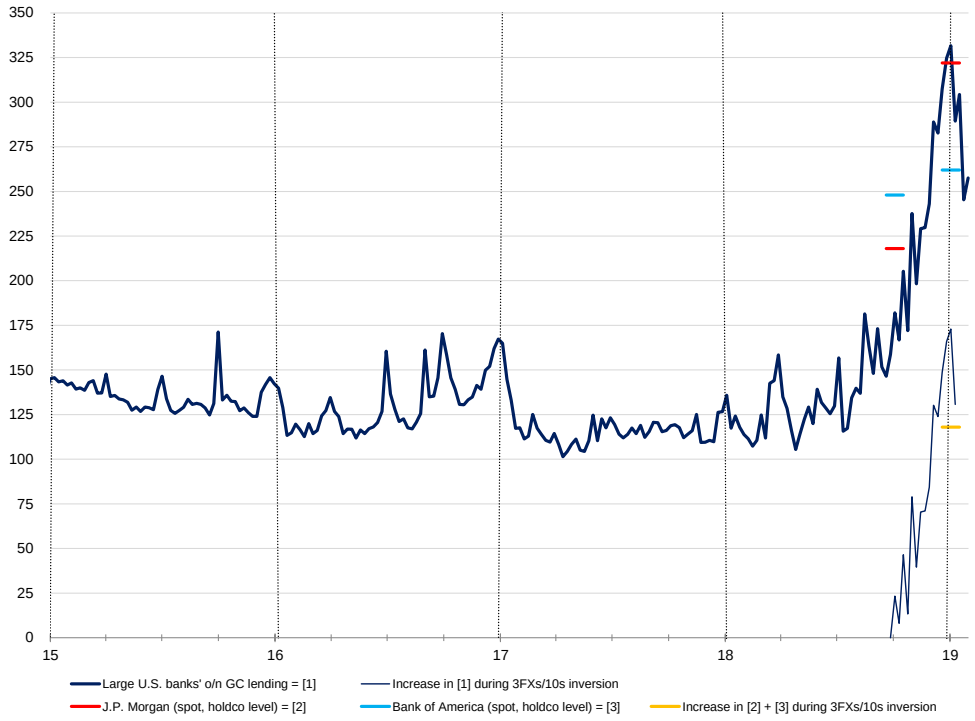
Percent, as of February 7th, 2019



Source: Credit Suisse, the BLOOMBERG PROFESSIONAL™ service

Figure 26: Meet the o/n GC Market's Lenders of Next-to-Last Resort

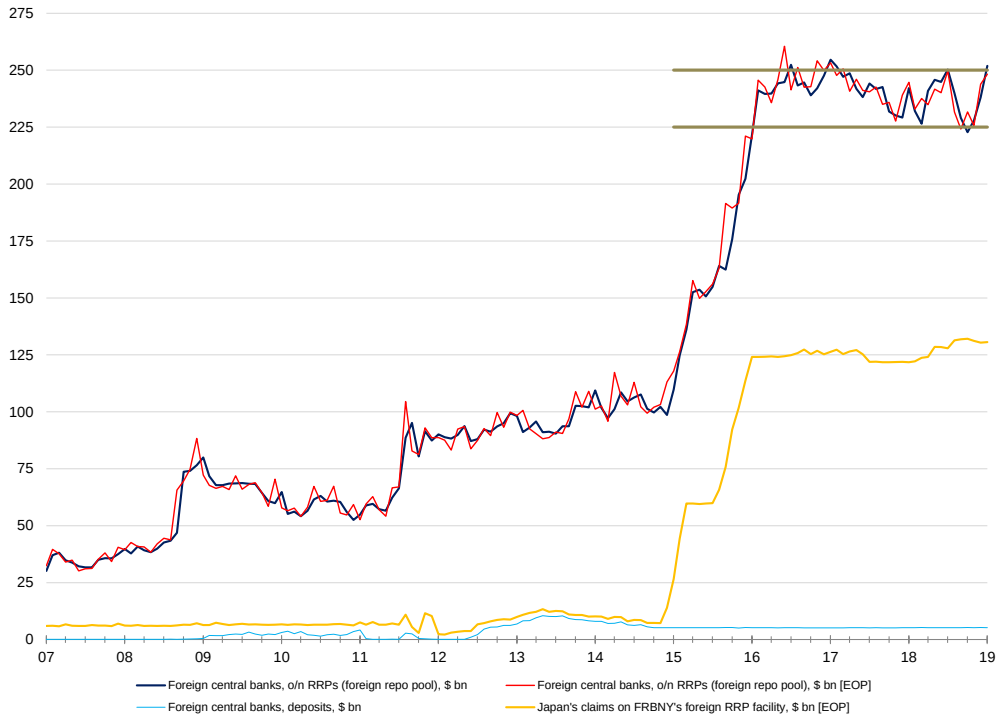
$ billions



Source: Credit Suisse, Company data, the BLOOMBERG PROFESSIONAL™ service

Figure 27: The Usage of FRBNY's Foreign RRP Facility

$ billions



Source: Credit Suisse, Ministry of Finance of Japan, the BLOOMBERG PROFESSIONAL™ service

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