

To: All SwapClear users

Subject: Proposed next steps for transition to USD SOFR discounting in SwapClear

26th July 2019

This paper sets out LCH's proposals in connection with the Federal Reserve Bank's Alternative Reference Rates Committee's Paced Transition Plan for SOFR adoption. It contains statements of opinion and intent, which remain subject to ongoing analysis and governance and the contents of this paper should not be treated as final or definitive. LCH Limited does not accept any liability in connection with the contents of this paper. Readers should seek their own legal, financial or other advice, as appropriate.

Dear SwapClear User

Earlier this year, LCH Limited announced plans to move to SOFR discounting¹ on all USD-denominated SwapClear contracts in the second half of 2020. This announcement was made following a broad consultation process which took place at the end of last year.

The changes to discounting will result in a *valuation* change for portfolios containing USD-denominated contracts, giving rise to valuation gains and losses from the switch. To address this issue we also announced that we would provide a compensation process designed to minimise the impact of these changes on our users. This decision was driven by feedback received from the respondents to our consultation.

The discounting change will also have the effect of changing the *risk profile* of the portfolio, as Fed Funds discounting risk becomes SOFR discounting risk at the point of conversion. During the consultation, we also heard from users that you wanted us to explore the idea of a risk-based compensation process to address this issue. Note that this change will not affect the coupon payments on any trades, which remain linked to their original benchmark rates.

This document is intended to provide further detail on our plans for the SwapClear compensation process, the timing of the switch and the scope of trades covered by the process. From a timing perspective we aim to strike a balance between keeping momentum on this important project and ensuring users have sufficient time to prepare for the changes, whilst avoiding other significant industry events in the calendar. From a scope perspective we are considering the balance between breadth of coverage and process complexity and aiming to make the overall transition as efficient as possible for our users. Our specific focus has been whether non-deliverable swaps in emerging market currencies², which also use Fed Funds for discounting and PAI/PAA, should be included.

The plan remains subject to further consultation, governance, legal and regulatory review. Details of the proposed process will be developed further and may change in light of further consultation feedback from participants. Discounting for cleared USD swaps is only one component of a much larger industry-wide initiative to transition from USD LIBOR to SOFR. However, we thought it essential at this time to provide our users with further information on what they should expect from the SwapClear service over the next 12-18 months and we actively welcome your continued cooperation and further feedback on these proposals.

We have attempted to design a compensation process, which is as simple and straightforward as possible. Yet, while respecting these constraints, the process should operate to a high level of accuracy, aim to provide coverage of risk

¹ SOFR is the Secured Overnight Funding Rate. The switch will apply to the underlying benchmark used for USD discounting (currently Fed Funds), Price Alignment Interest (PAI) and Price Alignment Amount (PAA), jointly henceforth referred to in this announcement as 'discounting'.

² The main use of Fed Funds discounting in LCH today is for USD LIBOR, USD Fed Funds and USD SOFR interest rate swaps; and USD CPI zero coupon inflation swaps. However, Fed Funds is also used in discounting for MXN swaps and non-deliverable swaps in 8 other currencies (KRW, CNY, INR, BRL, COP, CLP, THB, TWD).

mitigation where needed, with the flexibility to opt out of certain components if required. Taking all of this into account, we are proposing the following:

- i. compensation for the valuation and risk change will be provided as a combination of cash and compensating swaps;
- ii. *client* accounts will be able to elect cash-only if they choose to do so via their clearing broker;
- iii. an auction will be used to facilitate the cash-only election and to determine the cash compensating amounts;
- iv. we are targeting all USD-discounted positions in SwapClear to be in scope, including non-deliverable currencies³;
- v. we are targeting the conversion to take place on or around 17th October 2020.

In the following sections, we will go on to describe the rationale which led us to propose this design, provide more detail on the design itself, and discuss the current issues still outstanding.

1. Cash-based approach

In a basic, cash-only, compensation process, LCH could process a set of cash payments through the SwapClear service on the day of conversion in order to reverse out the valuation changes that occurred due to the new discounting curve. The valuation changes would be a function of the USD discounting risk in each portfolio and the relative levels of the Fed Funds and SOFR forward curves (most clearly expressed in the form of market prices for Fed Funds vs SOFR basis swaps) at the point of conversion.

The potential drawbacks with such a basic approach are:

- i. Dependency on market data:
Although the cash compensation amounts would be calculated 'precisely' for each portfolio using industry standard pricing models, the true level of precision is fully dependent on the quality of market data inputs that underpin it. In a cash-only process, there are likely to be incentives for some market participants to try to profit from the conversion/compensation process. This could undermine the integrity of the process as any temporary distortion in market levels would crystallise in a permanent economic impact once the compensation is paid with reference to those levels.
- ii. Lack of risk compensation:
Under a purely cash-compensated approach, the risk profile changes (as Fed Funds discounting risk becomes SOFR discounting risk) would be left to each individual SwapClear user to deal with independently. Although this risk can be re-hedged in the open market, the incremental cost of sourcing these hedges individually is likely to result in a much less efficient outcome, especially for smaller participants. These additional costs could potentially be avoided by a more complete, centralised approach.

2. Introducing compensating swaps

The dependency on market data inputs is a structural problem with all cash-only approaches, even in well-established, liquid markets. We believe that the best structural protection against this risk is physical delivery of the underlying instruments whose prices we are seeking to measure.

To achieve this, *risk* compensation could be provided to each user through a series of *compensating swaps*. Each compensating swap would be a standardised Fed Funds vs SOFR basis swap on one of the major benchmark tenors (e.g. 2y, 5y, 10y, 15y, 20y, 30y). The size and direction of each swap would be tailored such that the overall set of

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compensating swaps replicates the user's discounting risk profile at the point of conversion to the extent practicable. The main benefits of this approach are:

i. Resilience to market moves:

The value of the compensating swaps is directly dependent on the Fed Funds vs SOFR basis swap market. It should therefore absorb any short-term variation in prices (whatever the source) into its value. This should make the overall process much more resilient to any short-term market fluctuations at or around the point of conversion.

ii. Efficient re-hedging:

Another significant benefit of the compensating swap approach is that the required hedges would be determined centrally by LCH and provided to all user portfolios automatically at zero cost. Our assessment is that most accounts would seek to re-hedge their discounting risk and that this is the most cost effective way to achieve that outcome.

A worked example is included in the appendix to this document.

Limitations of a swaps-only solution

If the compensating swaps were structured to have zero spread on either leg, this would give them the useful property that the initial present value of the compensating swaps would closely replicate the value required to offset any gains or losses due to the discounting change. On the face of it, this might remove the need to determine market prices at the point of conversion or to provide cash compensation entirely for those taking the compensating swaps.

However, this solution has a significant drawback. The use of a small set of template instruments to represent the portfolio risk profile inevitably means that the present value of the swaps will not be a perfect replication of the discounting risk value transfer in all cases. Such differences could be caused by limitations in the granularity of tenor buckets or non-linear effects and will be small for the majority of accounts. However, certain users might find their positions are particularly susceptible to these effects and that the compensating swap replication is not sufficiently accurate.

We have examined whether the addition of more granular tenor buckets can address these issues and concluded that it is not possible to eliminate all these issues for all portfolios by simply adding more buckets.

Combining swaps with cash

To address the limitations of providing a single type of compensation, we are proposing to use a *combination* of cash (to provide *value* compensation) and swaps (to provide *risk* compensation). In this approach, as set out below, the compensating swaps would be *at market* with a spread on the SOFR leg calibrated to ensure a *zero present value* with respect to market levels at the point of conversion.

Cash payments would be calculated on a full revaluation basis using mid prices from the auction process to build a pricing curve (the auction will ask for two-way quotes). These same mid prices would be used to determine the required spreads on all compensating swaps with a view to ensuring zero present value.

This proposal is designed to maintain the benefits of both approaches while addressing the potential drawbacks. The swaps should provide a buffer against any short-term market distortions, while the cash element should ensure the value compensation is sufficiently accurate.

3. Client accounts allowed to elect cash-only compensation

We are aware that some buy-side customers may be unable or unwilling to accept compensation in the form of swaps. Restrictive trading or execution mandates may cause difficulties. Some users may not hedge their discounting risk and therefore might not recognise the compensating swaps as risk reducing.

For the reasons outlined in Section 2, we would strongly encourage client accounts towards acceptance of the compensating swaps. However, we recognise that SwapClear has a diverse set of users with differing requirements and have concluded it is important for us to offer an alternative. We therefore plan to allow client accounts to elect for a purely cash-based compensation if they choose to do so.

We anticipate that any opt-out decisions for client accounts will be provided to LCH by the relevant clearing broker, potentially via the LCH Portal. However, this option will be reserved for clients only, i.e. member accounts will not be able to opt out of the swap-based compensation.

To facilitate the cash-only election, LCH intends to run a centralised auction in order to:

- i. source the off-setting swaps required; and
- ii. establish the market value of these positions (which determines the amount of cash payable).

The auction result will also be used to calibrate the cash amounts and the spreads on the swaps provided to other users (i.e. to members and to clients who have are taking the swaps). However as noted above, those users should be relatively indifferent to the outcome of the auction as any short-term gains they make on the cash amount would be offset by valuation changes in the swaps, and vice versa. The benefits of this approach are as follows:

- i. Price discovery
The auction will be designed to generate fair and consistent prices for the cash compensation which are under-pinned by real transactions. We consider this to be a more resilient approach than attempting to infer the prevailing market level from live dealer or broker quotes.
- ii. Best execution
We believe that auctioning the residual positions together as a single swap for each tenor will significantly improve the execution price compared with the alternatives. This is due to concentrating liquidity at a point in time and the efficiencies from netting all the positions together. Although there will be a non-zero *auction cost* for clients electing cash-only, it will be shared among the gross longs and shorts, significantly reducing the costs for each user. Note that if any clients are unhappy with the proposed auction approach, they are free to take delivery of the swaps and close out the trades themselves in the open market.

We do expect there to be a materiality threshold whereby, below a certain size to be defined, an account would be provided cash-only by default. This is to prevent the operational burden of a proliferation of very small swap contracts for users with minimal USD discounting risk. We can also consider an approach whereby each of the compensating basis swaps is instead booked as two outright trades⁴. We believe this could help encourage adoption of the compensating swaps by enabling some users to overcome limitations on trading or booking specific to *basis swaps*.

We plan to consult further with members on the best way to ensure a successful auction and minimise the chance of failure (for example, there may be circumstances in which we may need to rely on dealer quotes or other fallback methods). The detailed rules and processes governing the auction will be provided to users closer to the time of conversion.

4. Timing

Our original consultation determined that a switch date in the second half of 2020 provided the right balance between maintaining momentum and ensuring users had sufficient time to prepare for the changes. We are mindful of ensuring sufficient time to test, deploy and dry run these proposals with our users and to avoid other events

⁴ For example, instead of a single basis swap in which the participant receives SOFR +spread and pays Fed Funds flat, the trade booking would be: (i) Swap 1: receive SOFR +spread, pay fixed; and (ii) Swap 2: receive fixed, pay Fed Funds.

impacting the industry in that timeframe. This led us to propose a mid-October date, specifically we are targeting the conversion to take place on or around 17th October 2020, with the auction taking place 1-2 days before that.

5. Scope

The main use of Fed Funds discounting in LCH today is for USD LIBOR, USD Fed Funds and USD SOFR interest rate swaps; and USD CPI zero coupon inflation swaps. However, Fed Funds is also used in discounting for MXN swaps and non-deliverable swaps in 8 other currencies (KRW, CNY, INR, BRL, COP, CLP, THB, TWD).

The discounting risk on the emerging market portfolios represents a small percentage of the overall discounting risk and therefore the potential compensation amounts for these currencies is small. However, running a separate compensation process for these products would be a major logistical challenge for the industry. We therefore propose including these products into a single, comprehensive, process; avoiding the need for a separate process later on.

6. Coordination with bilateral trades

We are aware that there are bilateral contracts in the market (mainly swaptions) which, subject to certain conditions, can deliver into LCH-cleared swaps. Irrespective of whether it originates from a swaption contract, any USD swap cleared by SwapClear after the conversion date will, from the point of clearing, be discounted at SOFR. However, the LCH compensation process will only apply to swaps that are registered at LCH before the conversion date.

We are supportive of an industry standard for bilateral compensation to be established for counterparties to pay or receive compensating amounts on swaption contracts. However, any such processes will ultimately need to be agreed between the bilateral counterparties to the original trades.

We have considered whether supporting a parallel discounting environment beyond the conversion date to allow legacy swaptions to exercise into Fed Funds-discounted cleared swaps could offer a solution and have concluded that this is not viable. We believe that a parallel USD discounting environment would increase complexity, undermine fungibility and bifurcate liquidity while postponing completion of the central objective (i.e. full transition to SOFR discounting). Our previous consultation outlined in detail the pros and cons of dual discounting vs a single-step approach and the conclusion of our users was that a single-step approach is preferred.

7. Conclusions

Since inception, LCH has been a strong supporter of the Federal Reserve Bank's Alternative Reference Rates Committee's efforts to reform interest rate benchmarks in the USD market. The conversion to SOFR discounting is a crucial step in realising this ambition.

We believe that our proposal represents the most efficient, comprehensive process possible, whilst minimising the impact on our users and eliminating unnecessary complexity. However, we recognise that this is an extremely important event for our users and we will continue to communicate our plans as they evolve.

If you have any comments or want to discuss any aspects of the plan in more detail please contact your LCH representative or get in touch via sofr@lch.com. We actively welcome your feedback on these proposals.

Yours faithfully

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Appendix: worked example for section 2 (creation of compensating swaps)

- Evaluate Fed Funds discounting risk in the portfolio:
P&L per +1bp change in discounting curve (simplified maturity representation):

Maturity	FF Discount Risk \$
1Y	-34,480
2Y	41,068
3Y	53,293
4Y	-42,002
5Y	-39,818
6Y	-480,138
7Y	-380,040
8Y	-40,947
9Y	-39,595
10Y	46,628
12Y	91,675
15Y	177,653
20Y	-98,054
25Y	-61,637
30Y	-8,291
40Y	-10,854
50Y	-3,198
Total	-828,735

- Aggregate risk into 6 major buckets for mapping to compensating swap template contracts:

Bucket	FF Discount Risk \$
2Y	28,116
5Y	-686,486
10Y	-202,654
15Y	214,323
20Y	-128,873
30Y	-53,161
Total	-828,735

- Assess impact of discounting switch on risk profile:

Bucket	FF Discount Risk \$	SOFr Discount Risk \$	Bucket	FF Discount Risk \$	SOFr Discount Risk \$
2Y	28,116	0	2Y	0	28,116
5Y	-686,486	0	5Y	0	-686,486
10Y	-202,654	0	10Y	0	-202,654
15Y	214,323	0	15Y	0	214,323
20Y	-128,873	0	20Y	0	-128,873
30Y	-53,161	0	30Y	0	-53,161
Total	-828,735	0	Total	0	-828,735

- Calculate required risk profile of compensating swaps:

Bucket	FF Discount Risk \$	SOFr Discount Risk \$
2Y	28,116	-28,116
5Y	-686,486	686,486
10Y	-202,654	202,654
15Y	214,323	-214,323
20Y	-128,873	128,873
30Y	-53,161	53,161
Total	-828,735	828,735

- Calculate required hedge notionals of compensating swaps:

Bucket	Hedge Notionals \$	Direction
2Y	142,180,582	rec FF, pay SOFR
5Y	1,418,754,796	rec SOFR, pay FF
10Y	217,085,165	rec SOFR, pay FF
15Y	159,421,558	rec FF, pay SOFR
20Y	75,167,706	rec SOFR, pay FF
30Y	22,701,128	rec SOFR, pay FF