

ISDA-Clarus RFR Adoption Indicator

Contents

ISDA-Clarus RFR Adoption Indicator	1
Introduction to the ISDA-Clarus RFR Adoption Indicator	2
Intended Audience.....	2
Table 1: Data Coverage	2
Whitepaper Structure	3
1. Data.....	4
Table 2: USD Data	4
Table 3: EUR Data.....	5
Table 4: GBP Data	6
Table 5: JPY Data.....	7
Table 6: AUD Data.....	8
Table 7: CHF Data.....	9
A Note on Basis Swaps.....	9
2. Standardizing the Data.....	10
Calculating Volume Weighted Average Maturity from SDR Data.....	10
Calculating DV01s	10
3. Calculating Indicator and Sub-Indicator Values.....	12
Indicator 1: ISDA-Clarus RFR Adoption Indicator.....	12
Sub-Indicator 1: Total IRD DV01 Traded per Month.....	12
Sub-Indicator 2: Total IRD Notional Traded per Month.....	13
Sub-Indicator 3: RFR-linked IRD DV01 Traded per Month Split by OTC and ETD	14
Sub-Indicators 4a and 4b: Percentage of DV01 per currency Traded as an RFR-linked IRD Product	15
Sub-Indicator 5: The Percentage of RFR-linked IRD DV01 per Currency Traded with a Tenor Longer than Two Years.....	16
Annex 1: Additional Data Sources.....	18
Eurex Example Data	18
ASX Example Data	18
ETD Data.....	19
Annex 2: Clarus Data Sources	19

Introduction to the ISDA-Clarus RFR Adoption Indicator

This whitepaper details the creation of an indicator (and sub-indicators) to monitor how much derivatives trading activity is conducted in risk-free rates (sometimes referred to as RFRs) across cleared interest rate derivatives (IRD) markets.

Intended Audience

This whitepaper is intended for persons interested in the following:

1. Scope of data used to construct the indicator and sub-indicator.
2. Indicator construction details.

Table 1: Data Coverage

The RFR Adoption Indicator incorporates multiple data sources across cleared IRD activity in six currencies:

Derivative Product Type	Currencies	Other Indices	Risk Free Rates	CCPs	Futures Contracts ¹
Over The Counter (OTC) Cleared Derivatives – All Product Types + Exchange Traded Derivatives (ETD)	AUD	AUD BBR-BBSW	AONIA	ASX CME LCH	ASX BankBills
	CHF	CHF LIBOR	SARON	CME EUREX ICE LCH	ICE Euroswiss
	EUR	EUR EURIBOR EUR LIBOR EUR EONIA	€STR	CME EUREX ICE LCH	CurveGlobal Euribor, Eurex EUR Eonia, Eurex EUR Euribor, Eurex EUR Secured, ICE Euribor, SwapFut: Eurex
	GBP	GBP LIBOR	SONIA	CME EUREX ICE LCH	CurveGlobal Sterling, ICE Sterling
	JPY	JPY LIBOR JPY TIBOR (ZTIBOR and DTIBOR)	TONA	CME JSCC EUREX LCH TFX	CME EuroYen, TFX EuroYen
	USD	USD LIBOR USD EFFR	SOFR	CME EUREX ICE LCH	CME Euro\$, CME Euro\$ Bundle, CME FedFunds, SwapFut: CME DSF, SwapFut: Eris Flex, SwapFut: Eris Std, SwapFut: Eris SOFR, SwapFut: ICE Swapnote

The indicator uses notional volume data in USD equivalents as the input data. Notional traded as reported by central counterparties (CCPs) is used for over-the-counter (OTC) IRD markets. The number of contracts traded is converted into notional equivalents for exchange-traded derivatives (ETD) markets.

¹ ETD contracts are short-term interest rate (STIR) money market futures, unless otherwise noted as a swap future

The indicator covers six currencies (AUD, CHF, EUR, GBP, JPY and USD). Contracts referencing historically dominant rates are grouped together as 'Other Indices'. These cover the major interbank offered rates (IBORs) in the six currencies, as well as EONIA and the effective federal funds rate (EFFR). The RFRs covered are USD SOFR, EUR €STR, GBP SONIA, JPY TONA, AUD AONIA, CHF SARON.

Only transactions cleared via a CCP are captured. All major CCPs that clear products in the six currencies are covered, including the Australian Stock Exchange (ASX), CME, Eurex, Intercontinental Exchange (ICE), the Japanese Securities Clearing Corporation (JSCC), LCH and the Tokyo Financial Exchange (TFX). The indicator is designed to be flexible in case other CCPs or futures contracts gain significant volumes.

Different CCPs follow different reporting standards for OTC derivatives. The data is therefore standardized:

- Volumes are always 'single-counted'. The cleared volumes in OTC IRD markets are calculated pre-novation to the CCP, so that a single trade is counted only once.
- Basis swaps involving an RFR leg appear in volumes for both RFRs and other indices.

Tenor (ie. duration of transactions) data is not homogeneous across CCP data sources or asset classes. It is therefore standardized:

- Grouped into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y by LCH and JSCC, and matched for all other CCPs that provide more granular data.
- LCH and CME RFR volumes greater than 2Y+ (SOFR and €STR) are calculated as per weighted average maturity of swap data repository (SDR) trades, floored at 5Y.
- Any futures contracts with a tenor less than 1Y are grouped into a single 1Y tenor.

Whitepaper Structure

This whitepaper is organized in three parts. The first part details the precise data that is collected per currency, including links to the source data itself where possible.

The second part explains the standardization that is necessary to collate the different data sources into a homogeneous pool of data. This involves maturity transformations into six standard tenors and the translation of notional amounts into risk equivalent measures (DV01).

The third part details the calculations performed to create each indicator and sub-indicator. The input data is created only once, with each sub-indicator representing a focus on a different subset of the data.

1. Data

The data sources for each currency are detailed below.

Table 2: USD Data

The coverage of data detailing products, CCPs and tenors is shown in the following table. Volumes are recorded in USD notional amounts.

Derivative Product Type	Indices	Products	CCP Data Sources	Tenor Data
OTC vs Other Indices	USD LIBOR (all published tenors) EFFR	<u>Basis</u> : Floating versus floating swaps with either leg versus USD LIBOR or EFFR <u>FRAs</u> : Floating rate agreements (FRAs) <u>IRS</u> : Fixed float interest rate swaps <u>OIS</u> : Overnight index swaps (OIS) <u>Swaption</u> <u>VNS</u> : Variable notional swaps (VNS) <u>XCCY</u> : Cross currency <u>ZC</u> : Zero coupon	CME LCH Eurex	<u>CME</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors. <u>LCH</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs Other Indices	USD LIBOR (3m) EFFR	<u>STIR</u> : CME Euro\$ <u>STIR</u> : CME Euro\$ bundle <u>STIR</u> : CME FedFunds <u>Swap Future</u> : Eris Flex <u>Swap Future</u> : Eris Std <u>Swap Future</u> : CME DSF	CME	As per closest contract tenor - ie, all Euro\$ are 3MO tenor, therefore translated into a 1Y tenor. Swap futures grouped into 2Y, 5Y, 10Y or 30Y. Note that ERIS Flex is excluded due to no tenor information (<0.00003%).
OTC vs RFR	SOFR	Basis (with either leg versus SOFR) OIS ZC	CME LCH	<u>CME and LCH</u> : SOFR data provided in 1Y, 2Y and 2Y+ buckets. 2Y+ is translated into the average SDR maturity per month (floored at 5Y).
ETD vs RFR	SOFR	<u>STIR</u> : CME SOFR (1 month & 3 month) <u>STIR</u> : ICE SOFR (1 month & 3 month) <u>Swap Future</u> : Eris SOFR	CME ICE	As per closest contract tenor.

Please note: CME SOFR data is not stored in CCPView, and is only available for use via ISDA. [HKEX](#) also publishes USD volumes without a tenor breakdown (<0.03% of volumes). Any Eurex USD OIS volumes reported are assumed to be EFR (not SOFR).

Table 3: EUR Data

The coverage of data detailing products, CCPs and tenors is shown in the following table. Volumes are recorded in USD notional equivalent amounts, with the FX rate updated at each month -end.

Derivative Product Type	Indices	Products	CCPs	Tenor Data
OTC vs Other Indices	EUR EURIBOR (all published tenors). EUR LIBOR (all published tenors) EONIA	<u>Basis</u> : Floating versus floating swaps with either leg versus EURIBOR, EUR LIBOR or EONIA <u>FRAs</u> <u>IRS</u> <u>OIS</u> <u>VNS</u> <u>XCCY</u> <u>ZC</u>	CME LCH Eurex	<u>CME</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors. <u>LCH</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs Other Indices	EUR EURIBOR (3m) EONIA	<u>STIR</u> : ICE EURIBOR 3M <u>STIR</u> : Eurex EURIBOR 3M <u>STIR</u> : CurveGlobal EURIBOR 3M <u>Swap Future</u> : ICE Swapnote <u>Swap Future</u> : ICE ERIS Std	Eurex ICE LCH (CurveGlobal)	As per closest contract tenor – ie, all EURIBOR are 3MO tenor, therefore translated into a 1Y tenor. Swap futures grouped into 2Y, 5Y, 10Y or 30Y.
OTC vs RFR	€STR	Basis (with either leg versus €STR) OIS ZC	LCH Eurex	<u>LCH</u> : €STR data provided in 1Y, 2Y and 2Y+ buckets. 2Y+ is translated into the average SDR maturity per month (floored at 5Y). <u>Eurex</u> : does not provide €STR specific volumes.
ETD vs RFR	€STR	<u>Pending</u>	No CCP lists €STR futures	<u>Pending</u>

Table 4: GBP Data

The coverage of data detailing products, CCPs and tenors is shown in the following table. Volumes are recorded in USD notional equivalent amounts, with the FX rate updated at each month-end.

Derivative Product Type	Indices	Products	CCPs	Tenor Data
OTC vs Other Indices	GBP LIBOR (all published tenors).	<u>Basis</u> : Floating versus floating swaps with either leg versus GBP LIBOR. <u>FRAs</u> <u>IRS</u> <u>OIS</u> <u>VNS</u> <u>ZC</u>	CME LCH Eurex	<u>CME</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors. <u>LCH</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs Other Indices	GBP LIBOR (3m)	<u>STIR</u> : ICE Short Sterling 3M <u>STIR</u> : CurveGlobal Short Sterling 3M <u>Swap Future</u> : ICE ERIS Std	ICE LCH (CurveGlobal)	As per closest contract tenor – ie, all short sterling are 3MO tenor, therefore translated into a 1Y tenor. Swap futures grouped into 2Y, 5Y, 10Y or 30Y.
OTC vs RFR	SONIA	Basis (with either leg versus SONIA) OIS ZC	CME LCH Eurex	<u>LCH</u> : SONIA data provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>CME</u> : Granular data is bucketed into the standard tenors. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs RFR	SONIA	<u>STIR</u> : CME SONIA (1 month & 3 month) <u>STIR</u> : ICE SONIA (1 month & 3 month) <u>STIR</u> : CurveGlobal SONIA (1 month & 3 month)	CME ICE LCH (CurveGlobal)	As per closest contract tenor. All volume so far is a 1Y tenor.

Please note: SONIA data is collected at a more granular tenor level than SOFR and €STR due to existence of a single OIS rate in GBP markets.

Table 5: JPY Data

The coverage of data detailing products, CCPs and tenors is shown in the following table. Volumes are recorded in USD notional equivalent amounts, with the FX rate updated at each month-end.

Derivative Product Type	Indices	Products	CCPs	Tenor Data
OTC vs Other Indices	JPY LIBOR (all published tenors). JPY TIBOR (all published tenors, both DTIBOR and ZTIBOR).	<u>Basis</u> : Floating versus floating swaps with either leg versus JPY LIBOR or TIBOR. <u>FRAs</u> <u>IRS</u> <u>OIS</u> <u>VNS</u> <u>ZC</u>	CME LCH JSCC Eurex	<u>CME</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors. <u>LCH</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>JSCC</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. 'Other' maturities excluded. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs Other Indices	JPY TIBOR (3m)	<u>STIR</u> : TFX Euroyen 3MO	TFX	As per closest contract tenor – ie, all euroyen are 3MO tenor, therefore translated into a 1Y tenor.
OTC vs RFR	TONA	Basis (with either leg versus TONA) OIS ZC	CME Eurex JSCC LCH	<u>LCH & JSCC</u> : TONA data provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>CME & Eurex</u> : Granular data is bucketed into the standard tenors.
ETD vs RFR	TONA	<u>Pending</u>	No CCP lists TONA futures	Pending

Please note: JSCC data has >30YR tenor bucket mapped to 50YR for standardization.

TONA data is collected at a more granular tenor level than SOFR and €STR due to existence of a single OIS rate in JPY markets.

Table 6: AUD Data

The coverage of data detailing products, CCPs and tenors is shown in the following table. Volumes are recorded in USD notional equivalent amounts, with the FX rate updated at each month-end.

Derivative Product Type	Indices	Products	CCPs	Tenor Data
OTC vs Other Indices	AUD BBR-BBSW (all published tenors).	<u>Basis</u> : Floating versus floating swaps with either leg versus BBSW. <u>FRA</u> s <u>IRS</u> <u>OIS</u> <u>VNS</u> <u>ZC</u>	CME LCH ASX	<u>CME</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors. <u>LCH</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>ASX</u> : Tenor data is provided in 1Y, 2Y, 5Y, 10Y, 30Y buckets.
ETD vs Other Indices	AUD BBR-BBSW (3m)	<u>STIR</u> : ASX Bank Bills 90 Day	ASX	As per closest contract tenor – ie, all bank bills are 3MO tenor, therefore translated into a 1Y tenor.
OTC vs RFR	AONIA	Basis (with either leg versus AONIA) OIS ZC	ASX CME LCH	<u>LCH</u> : AONIA data provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>CME</u> : Granular data is bucketed into the standard tenors. <u>ASX</u> : Tenor data is provided in 1Y, 2Y, 5Y, 10Y, 30Y buckets..
ETD vs RFR	AONIA	<u>STIR</u> : ASX 30 Day Cash Rate	ASX	As per closest contract tenor – ie, all cash futures are 1MO tenor, therefore translated into a 1Y tenor.

AONIA data is collected at a more granular tenor level than SOFR and €STR due to existence of a single OIS rate in AUD markets.

Table 7: CHF Data

The coverage of data detailing products, CCPs and tenors is shown in the following table. Volumes are recorded in USD notional equivalent amounts, with the FX rate updated at each month-end.

Derivative Product Type	Indices	Products	CCPs	Tenor Data
OTC vs Other Indices	CHF LIBOR (all published tenors).	<u>Basis</u> : Floating versus floating swaps with either leg versus CHF LIBOR. <u>FRAs</u> <u>IRS</u> <u>OIS</u> <u>VNS</u> <u>ZC</u>	CME LCH Eurex	<u>CME</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors. <u>LCH</u> : Tenor data is provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs Other Indices	CHF LIBOR (3m)	<u>STIR</u> : ICE Euroswiss 3M	ICE	As per closest contract tenor – ie, all euroswiss are 3MO tenor, therefore translated into a 1Y tenor.
OTC vs RFR	SARON	Basis (with either leg versus AONIA) OIS ZC	LCH Eurex	<u>LCH</u> : SARON data provided in 2Y, 5Y, 10Y, 30Y and 50Y buckets. <u>Eurex</u> : Granular tenor data is bucketed into 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors.
ETD vs RFR	SARON	<u>STIR</u> : Eurex CHF SARON 3 month	Eurex	As per closest contract tenor – ie, all SARON futures are 3MO tenor, therefore translated into a 1Y tenor.

SARON data is collected at a more granular tenor level than SOFR and €STR due to existence of a single OIS rate in CHF markets (CHF TOIS ceased to exist as of end-2017).

A Note on Basis Swaps

The following single currency basis swaps are included as volumes for both RFRs and other indices:

- IBOR vs. RFR
- EFR vs. SOFR
- EONIA vs. €STR

2. Standardizing the Data

As noted above, all of the tenor data is standardized into six buckets. For RFR-linked IRD data in EUR and USD (ie, where this is more than a single OIS index), this is slightly more complex because CCPs provide a single '2Y+' tenor bucket. To ensure that DV01s are calculated appropriately, this 2Y+ tenor bucket is mapped to the volume weighted average maturity of EUR or USD RFR trades reported to US SDRs within that month.

Once all USD-equivalent notional amounts are collated into their appropriate tenor buckets, these notional amounts are then translated into DV01 risk equivalent amounts.

Calculating Volume Weighted Average Maturity from SDR Data

The appropriate weighted average maturity per month from US SDR data in EUR and USD RFR-linked IRD transactions is calculated as per below:

1. Map each tenor per transaction to a multiple of months.
2. Multiply number of months by volume per tenor point (volume in USD DV01² equivalent. DV01s are calculated by Clarus at the transaction level for SDR data.).
3. Sum results of (2) per month across every tenor reported.
4. Divide result of 3 by total volume reported for each month.

The result of (4) is floored at 60 months, such that the resulting value in years is always calculated as $\text{MAX}\{5, \text{ROUND}(\text{AvMaturity})\}$ where 60 months is equal to 5 years.

This is then matched to our standard tenor buckets of 1Y, 2Y, 5Y, 10Y, 30Y or 50Y.

All RFR-linked IRD transactions within the currency are considered from the SDR data – both outright and basis, as well as trades with maturities of less than 1Y and less than 2Y. This is so that a single (or small number) of long-dated trade(s) will not have a large effect on the average maturity calculation. The output is floored at 5Y.

Calculating DV01s

The DV01 of an interest rate derivative is the 'discounted value of a basis point'. This describes the valuation change in a derivative contract resulting from a (parallel) 1 basis point (0.01%) shift in the interest rate swaps that are used to value it.

To calculate the approximate DV01s from notional volume traded, the following process is applied:

1. Standardized DV01s for par (at-market) swaps are calculated for the standardized tenors, 1Y, 2Y, 5Y, 10Y, 30Y and 50Y.
2. All DV01s are calculated on the USD curve, irrespective of the underlying currency.
3. The par swaps are modelled as forward-starting swaps, out of the next quarterly international monetary market (IMM) date. This is to avoid any complications of including/excluding the first fixing. The DV01 also fluctuates less month-on-month (for the same market rates) because the exact number of days in the swap is more consistent.
4. The DV01 is calculated by valuing the swap at market (net present value (NPV) = zero) and then applying a parallel shift to the curve of 1 basis point (0.01%) and recalculating the NPV at the shifted market rates.

² The original version of the indicator calculated Weighted Average Maturity from SDR data using volume in USD **notional** equivalents. Testing showed that a DV01-weighting is a fairer representation of activity.

5. DV01s are calculated once per month and applied to each asset class equally. The calculations assume that the differences between DV01s for OTC and ETD IBOR-linked IRD, OIS, and RFR-linked IRD are sufficiently similar for there to be no discernible impact on the calculations.
6. ETD contracts are translated into notional equivalents and the equivalent swap DV01 applied. The 'tick' value of the contract is not used.

A different DV01 is calculated for each month in the time series. This allows for the fact that DV01s increase (decrease) as market rates move lower (higher). DV01s are calculated using market data as of the first day of the month (with market rates rolled forward from the previous good working day).

Par DV01s						
	1YR	2YR	5YR	10YR	30YR	50YR
Jul-18	99	195	472	886	2,118	2,951
Aug-18	99	195	471	880	2,071	2,846
Sep-18	99	196	473	888	2,108	2,919
Oct-18	99	195	469	875	2,034	2,770
Nov-18	99	195	470	875	2,011	2,721
Dec-18	99	196	472	881	2,038	2,758
Jan-19	99	195	474	890	2,101	2,891
Feb-19	99	196	474	892	2,105	2,891
Mar-19	99	196	475	891	2,078	2,837
Apr-19	99	195	476	898	2,140	2,964
May-19	99	196	476	898	2,127	2,924
Jun-19	99	197	482	916	2,240	3,168
Jul-19	99	196	481	917	2,246	3,184
Aug-19	99	197	484	928	2,309	3,320
Sep-19	99	198	489	949	2,484	3,727
Oct-19	99	197	486	939	2,420	3,575
Nov-19	99	197	486	936	2,383	3,493
Dec-19	99	197	486	934	2,372	3,476
Jan-20	99	197	483	922	2,293	3,307
Feb-20	99	197	487	942	2,421	3,635
Mar-20	100	198	492	961	2,561	3,992
Apr-20	100	200	498	979	2,724	4,410
May-20	100	200	499	982	2,752	4,482

3. Calculating Indicator and Sub-Indicator Values

Indicator 1: ISDA-Clarus RFR Adoption Indicator

The input data is standardized into DV01 amounts, expressed in USD, for each of the six tenor buckets (1Y, 2Y, 5Y, 10Y, 30Y and 50Y) per IRD product, per currency. To calculate the ISDA-Clarus RFR Adoption Indicator:

1. The sum of all DV01s for OTC and ETD RFR-linked IRD products for all six currencies.
2. The sum of DV01s for all indices (both RFR and other indices) across all IRD products³.
3. The result of (1) is divided by (2). The indicator variable is expressed as a percentage.

Mathematically;

$$\frac{\sum_{i \in A} \sum_{j \in B} \sum_{k \in C} DRFR_{ijk}}{\sum_{i \in A} \sum_{j \in B} \sum_{k \in C} DRFR_{ijk} + \sum_{i \in A} \sum_{j \in B} \sum_{k \in C} DOther_{ijk}} = \text{Indicator 1}$$

Where;

A = 1Y, 2Y, 5Y, 10Y, 30Y and 50Y tenors;

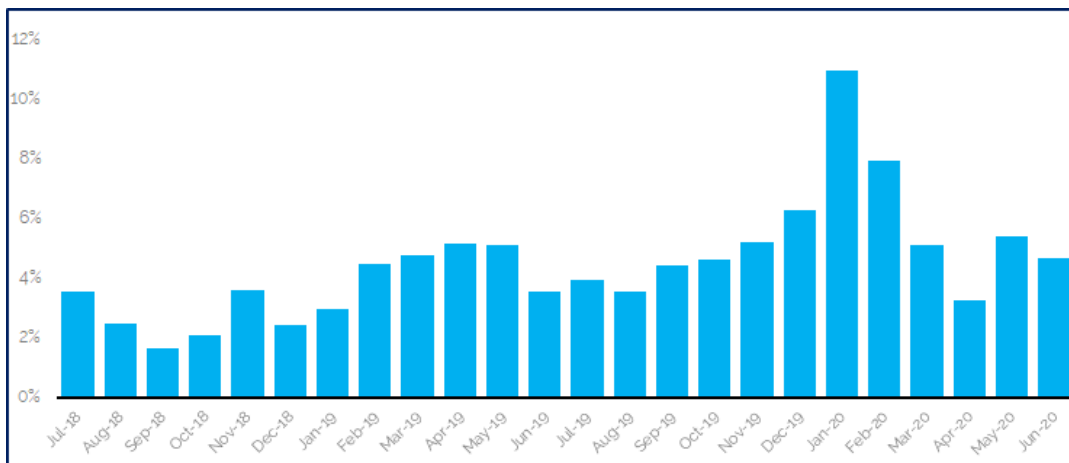
B = AUD, CHF, EUR, GBP, JPY and USD;

C = OTC and ETD;

DRFR = DV01 of RFR products

DOther = DV01 of other indices products

The time series produces Chart 1: RFR Adoption Indicator: % of DV01 Transacted as RFR-linked IRD Products in USD, EUR, GBP, JPY, AUD and CHF.



Sub-Indicator 1: Total IRD DV01 Traded per Month

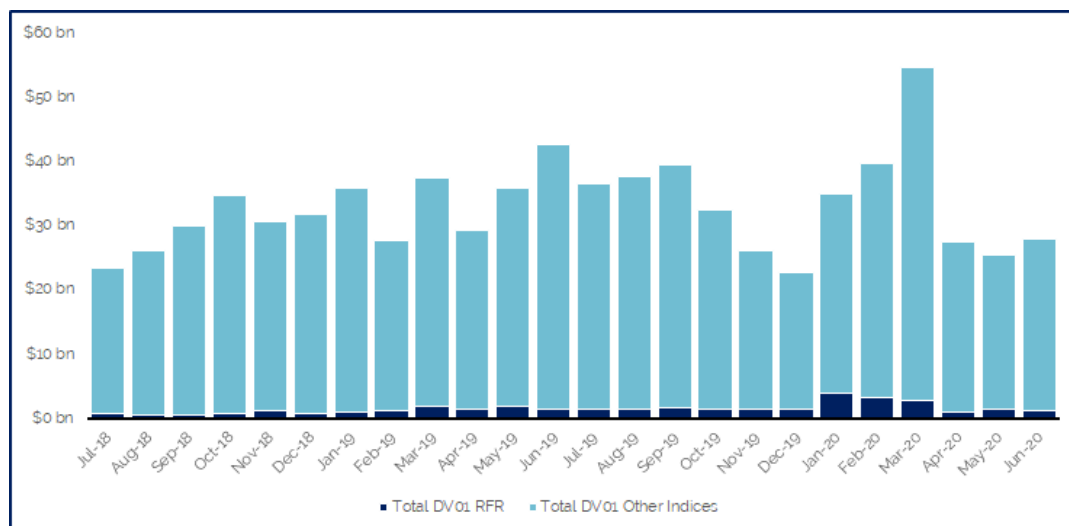
A descriptive time series, displaying total IRD DV01 traded across all currencies Error! Bookmark not defined.. For the methodology to translate notional amounts into DV01 amounts, please see the *Calculating DV01s* section.

³ Note that all indicator values exclude cash instruments

$$\sum_{i \in A} \sum_{j \in B} \sum_{k \in C} DRFR_{ijk} + \sum_{i \in A} \sum_{j \in B} \sum_{k \in C} DOther_{ijk} = Sub - Indicator 1$$

The sub-indicator variable is expressed in millions of USD of DV01.

Chart 2: Total IRD DV01 Traded per Month



Sub-Indicator 2: Total IRD Notional Traded per Month

A second descriptive time series, displaying total IRD notional traded across all six currencies. The input data per currency is detailed in the *Data* section.

$$\sum_{i \in A} \sum_{j \in B} \sum_{k \in C} VRFR_{ijk} + \sum_{i \in A} \sum_{j \in B} \sum_{k \in C} VOther_{ijk} = Sub - Indicator 2$$

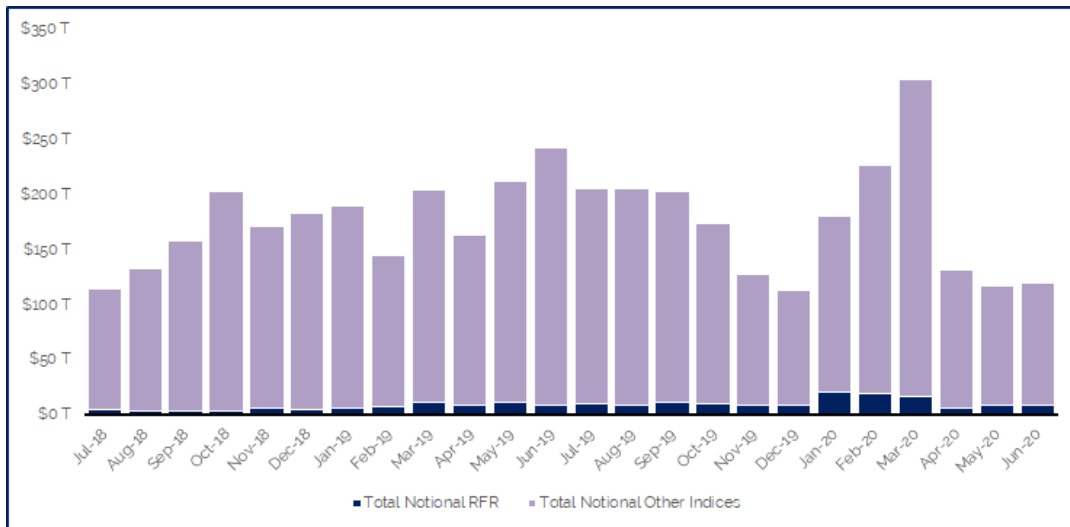
Where;

VRFR = Notional volume of RFR derivatives products in USD equivalents;

VOther = Notional volume of other indices derivatives products in USD equivalents.

The sub-indicator variable is expressed in millions of USD notional equivalent.

Chart 3: Total IRD Notional Traded per Month



Sub-Indicator 3: RFR-linked IRD DV01 Traded per Month Split by OTC and ETD

The input data is standardized into DV01 amounts, expressed in USD, for each of the six tenor buckets (1Y, 2Y, 5Y, 10Y, 30Y and 50Y) for ETD per currency. To calculate the percentage traded as ETD:

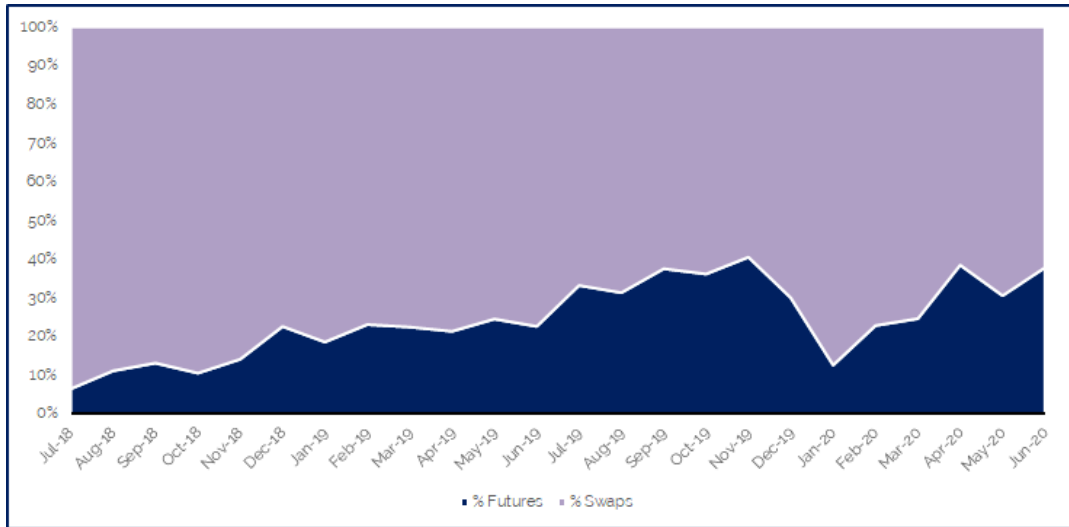
1. All DV01s are summed for ETD RFR-linked IRD products across all six currencies.
2. All OTC and ETD RFR-linked IRD DV01s are summed.
3. The result of (1) is divided by (2).

Mathematically;

$$\frac{\sum_{i \in A} \sum_{j \in B} \sum_{k=ETD} DRFR_{ijk}}{\sum_{i \in A} \sum_{j \in B} \sum_{k \in C} DRFR_{ijk}} = \text{Sub - Indicator 3}$$

The sub-indicator variable is expressed as a percentage.

Chart 4: RFR-linked IRD DV01 Traded per Month Split by OTC and ETD displays the resulting time series.



Sub-Indicators 4a and 4b: Percentage of DV01 per currency Traded as an RFR-linked IRD Product

The input data is standardized into DV01 amounts, expressed in USD, for each of the six tenor buckets (1Y, 2Y, 5Y, 10Y, 30Y and 50Y) for all IRD products, per currency. To calculate the percentage traded as an RFR-linked IRD product:

1. DV01s are summed for RFR-linked IRD products (OTC and ETD) per currency.
2. DV01s are summed across all OTC and ETD IRD products (both RFR and other indices) per currency.
3. The result of (1) is divided by (2) per currency.

Mathematically for USD;

$$\frac{\sum_{i \in A} \sum_{j=USD} \sum_{k \in C} DRFR_{ijk}}{\sum_{i \in A} \sum_{j=USD} \sum_{k \in C} DRFR_{ijk} + \sum_{i \in A} \sum_{j=USD} \sum_{k \in C} DOther_{ijk}} = \text{Sub - Indicator 4 (a and b)}$$

And replicated for each value of j in B.

The sub-indicator variables are expressed as percentages.

The time series produces Chart 5a: The Percentage of DV01 Traded as an RFR-linked IRD Product.

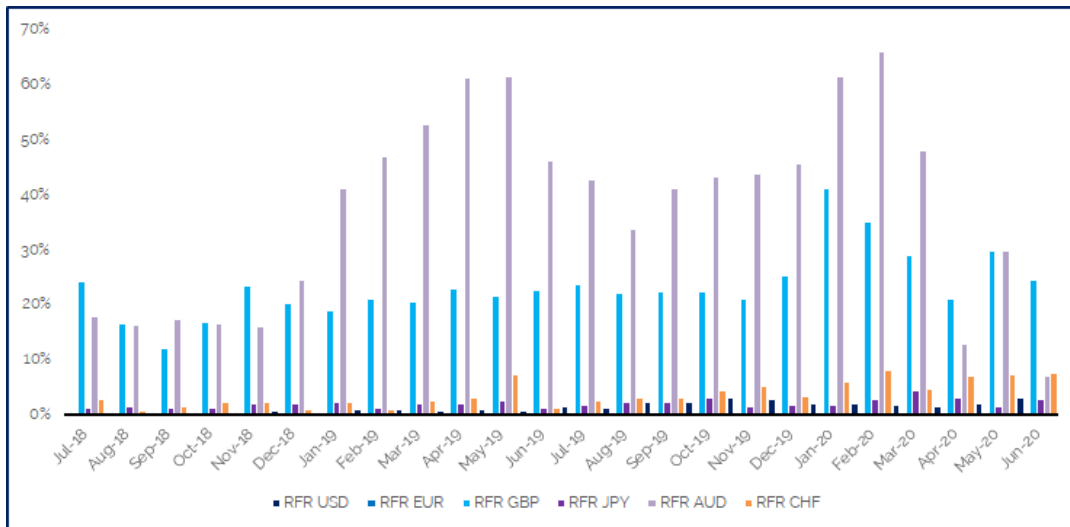
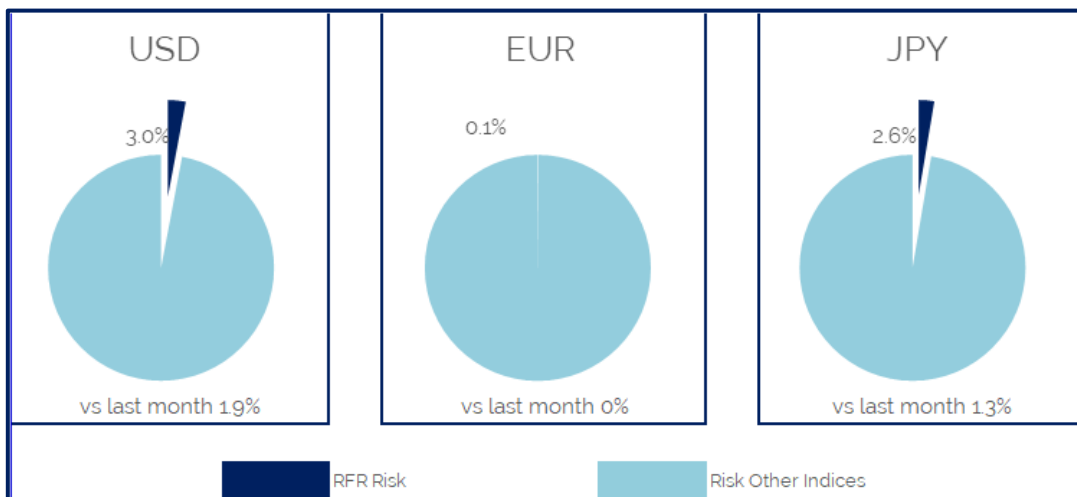


Chart 5b: The Percentage of DV01 Traded as an RFR-linked IRD in USD, EUR and JPY uses identical data, but focuses on three currencies.



Sub-Indicator 5: The Percentage of RFR-linked IRD DV01 per Currency Traded with a Tenor Longer than Two Years

The input data is standardized into DV01 amounts, expressed in USD, for each of the six tenor buckets (1Y, 2Y, 5Y, 10Y, 30Y and 50Y) for all IRD products, per currency. To calculate the percentage traded as an RFR-linked IRD product:

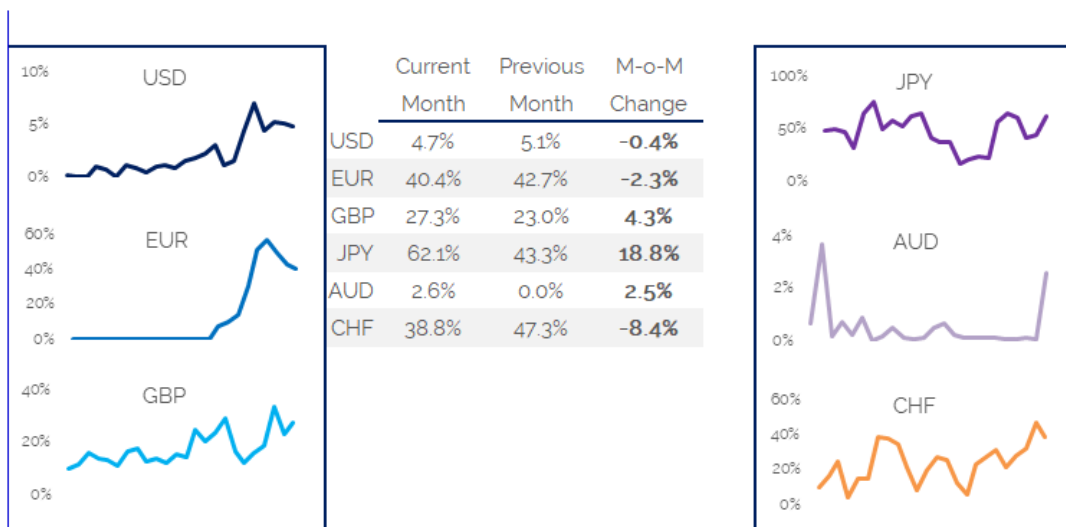
1. DV01s are summed for RFR-linked IRD products (OTC and ETD) per currency in the 5Y, 10Y, 30Y and 50Y tenors.
2. DV01s are summed for RFR-linked IRD products (OTC and ETD) per currency across all tenor buckets.
3. The result of (1) is divided by (2) per currency. The sub-indicator variable is expressed as a percentage.

Mathematically;

$$\frac{\sum_{i=1Y,2Y} \sum_{j=USD} \sum_{k \in C} DRFR_{ijk}}{\sum_{i \in A} \sum_{j=USD} \sum_{k \in C} DRFR_{ijk}} = \text{Sub - Indicator 5}$$

And replicated for each value of *j* in *B*.

The time series produces Chart 6: The Percentage of RFR-linked IRD DV01 per Currency Traded with a Tenor Longer than Two Years.



Annex 1: Additional Data Sources

Three CCPs provide data to Clarus over and above the data reported on their websites. The CCPs are:

1. LCH SwapClear
2. Eurex
3. ASX

The additional data provided is primarily the tenor split of activity. LCH, for example, has been providing Clarus tenor data since 2017. As part of the publication of the ISDA-Clarus RFR Adoption Indicator, these data sources have been expanded to include additional CCPs.

Eurex Example Data

An example of the additional EUREX OTC IRD data provided is shown below.



Total Notional Cleared (in currency of the trade)								
Product Name	Currency	0-1 year	1-2 years	2-5 years	5-10 years	10-20 years	20-30 years	30+ years
Swap	CHF	13,200,000,000	0	360,000,000	630,000,000	100,000,000	0	0
FRA	CHF	-	0	0	0	0	0	0
OIS	CHF	-	0	0	0	0	0	0
ZCIS	CHF	-	0	0	0	0	0	0
BasisSwap	CHF	-	0	0	0	0	0	0

ASX Example Data

An example of the additional ASX OTC IRD data provided is shown below.

	BBSWvsFixed	AONIAvsFixed	BBSW Basis Swaps	BBSW AONIA Basis Swaps
Jul-18	\$ 185,704,000,000.00	\$ 184,440,000,000.00	\$ 7,500,000,000.00	\$ 2,000,000,000.00
1YR	\$ 162,140,000,000.00	\$ 184,200,000,000.00	\$ 6,500,000,000.00	\$ 2,000,000,000.00
2YR	\$ 9,881,000,000.00	\$ 240,000,000.00	\$ 200,000,000.00	
5YR	\$ 13,156,500,000.00		\$ 600,000,000.00	
10YR	\$ 480,000,000.00		\$ 200,000,000.00	
30YR	\$ 46,500,000.00			
Aug-18	\$ 176,929,400,000.00	\$ 220,450,000,000.00	\$ 6,468,000,000.00	\$ 609,000,000.00
1YR	\$ 152,996,000,000.00	\$ 179,800,000,000.00	\$ 1,600,000,000.00	
2YR	\$ 11,757,800,000.00	\$ 40,650,000,000.00	\$ 3,194,000,000.00	\$ 349,000,000.00
5YR	\$ 11,467,600,000.00		\$ 1,374,000,000.00	\$ 200,000,000.00
10YR	\$ 644,000,000.00		\$ 300,000,000.00	\$ 60,000,000.00
30YR	\$ 64,000,000.00			
Sep-18	\$ 233,623,000,000.00	\$ 54,506,000,000.00	\$ 14,225,000,000.00	\$ 2,300,000,000.00
1YR	\$ 198,562,000,000.00	\$ 54,506,000,000.00	\$ 5,390,000,000.00	
2YR	\$ 5,480,500,000.00		\$ 6,294,500,000.00	\$ 2,100,000,000.00
5YR	\$ 29,217,000,000.00		\$ 1,982,500,000.00	\$ 200,000,000.00
10YR	\$ 363,500,000.00		\$ 538,000,000.00	
30YR			\$ 20,000,000.00	

ETD Data

The ETD contracts covered are:

- MMFut: ASX BankBillFutures
- MMFut: CME Euro\$
- MMFut: CME Euro\$ Bundle
- MMFut: CME EuroYen
- MMFut: CME FedFunds
- MMFut: CurveGlobal Euribor
- MMFut: CurveGlobal Sterling
- MMFut: Eurex EUR Eonia
- MMFut: Eurex EUR Euribor
- MMFut: Eurex EUR Secured
- MMFut: ICE Euribor
- MMFut: ICE Euroswiss
- MMFut: ICE Sterling
- MMFut: TFX EuroYen
- SwapFut: CME DSF
- SwapFut: Eris Flex
- SwapFut: Eris Std
- SwapFut: Eris SOFR
- SwapFut: Eurex
- SwapFut: ICE Swapnote

Annex 2: Clarus Data Sources

CCP volume data for both OTC and ETD IRD is available via [Clarus CCPView](#). All indicators are built using [Clarus Microservices](#).

Clarus Microservices are fine-grained services that can be used to rapidly assemble a more complex service, a system, or a user interface.

Unlike libraries and toolkits,

Microservices do not require the use of a specific programming language and they do not need to be installed, managed or upgraded.

Clarus Microservices are deployed on Amazon Web Services (AWS cloud) and can be accessed by anyone using their own choice of programming language (python, perl, r, java, c#, etc. and in MS Excel).

The range of Microservices used to create these indicators is covered by:

1. **SDR**: providing data for average maturity data.
2. **Market**: providing risk and analytics for DV01 calculations.
3. **CCP**: providing data for CCP volumes.

