

TRANSITION TO RFRs REVIEW: Full Year 2020 and the Fourth Quarter of 2020

The Transition to Risk-free Rates (RFRs) Review analyzes the trading volumes of over-the-counter (OTC) and exchange-traded interest rate derivatives (IRD) that reference selected alternative RFRs, including the Secured Overnight Financing Rate (SOFR), the Sterling Overnight Index Average (SONIA), the Swiss Average Rate Overnight (SARON), the Tokyo Overnight Average Rate (TONA), the Euro Short-Term Rate (€STR) and the Australian Overnight Index Average (AONIA).

Global data is collected from all major central counterparties (CCPs) that clear OTC and exchange-traded derivatives (ETD) in the six currencies, including the Australian Securities Exchange, CME Group, Eurex, Intercontinental Exchange (ICE), Japan Securities Clearing Corporation, LCH and the Tokyo Financial Exchange. Only cleared transactions are captured in this data.

US data is collected from the Depository Trust & Clearing Corporation (DTCC) swap data repository (SDR). It therefore only covers trades that are required to be disclosed under US regulations and includes cleared and non-cleared OTC IRD transactions.

KEY HIGHLIGHTS FOR THE FULL YEAR 2020 AND THE FOURTH QUARTER OF 2020

Global Trading Activity¹

In the full year 2020:

The ISDA-Clarus RFR Adoption Indicator increased to 7.6% in the full year 2020 compared to 4.6% in the prior year². The indicator tracks how much global trading activity (as measured by DV01) is conducted in cleared OTC and exchange-traded IRD that reference the identified RFRs in six major currencies³.

RFR-linked IRD traded notional accounted for 8.8% of total IRD traded notional compared to 5.4% in 2019.

In the fourth quarter of 2020:

The ISDA-Clarus RFR Adoption Indicator reached 9.9% compared to 8.5% in the prior quarter. RFR-linked IRD traded notional accounted for 12.3% of total IRD traded notional versus 10.6% in the third quarter of 2020.

Trading Activity in the US⁴

In the full year 2020:

In the US, traded notional of OTC IRD referencing alternative RFRs increased by 114.1% to \$18.7 trillion compared to \$8.7 trillion in 2019⁵. RFR transactions accounted for 8.1% of total IRD traded notional compared to 3.4% in the prior year. The increase was primarily driven by higher trading activity in SONIA-linked derivatives.

¹ The global data is collected from all major central counterparties (CCPs) that clear over-the-counter (OTC) and exchange-traded derivatives (ETD) in the six currencies, including the Australian Securities Exchange, CME Group, Eurex, Intercontinental Exchange (ICE), Japan Securities Clearing Corporation, LCH and the Tokyo Financial Exchange. Only cleared transactions are captured in this data

² ISDA-Clarus RFR Adoption Indicator White Paper: <https://www.isda.org/a/SlmTE/ISDA-Clarus-RFR-Adoption-Indicator-Whitepaper.pdf>

³ The RFR Adoption Indicator was 10.0% in December 2020. ISDA-Clarus RFR Adoption Indicator, December 2020: <https://www.isda.org/a/lubTE/ISDA-Clarus-RFR-Adoption-Indicator-December-2020.pdf>

⁴ The US data is collected from the Depository Trust & Clearing Corporation (DTCC) swap data repository (SDR). It therefore only covers trades that are required to be disclosed under US regulations and includes cleared and non-cleared OTC IRD transactions

⁵ This data covers only transactions that are required to be disclosed under US regulations

- IRD traded notional referencing SOFR increased to \$1.3 trillion from \$379.9 billion in the prior year. The proportion of IRD traded notional linked to SOFR remained small, accounting for only 0.6% of total IRD traded notional and 7.1% of IRD traded notional referencing RFRs.
- IRD traded notional referencing SONIA increased to \$17.0 trillion in 2020 compared to \$8.1 trillion in 2019. SONIA transactions accounted for 7.4% of total IRD traded notional and represented 90.9% of IRD traded notional referencing RFRs⁶.
- Traded notional of IRD referencing LIBOR denominated in US dollars, sterling, Swiss franc, yen and euro, as well as EURIBOR and TIBOR, decreased to \$140.0 trillion compared to \$158.6 trillion in 2019. These interbank offered rates (IBORs) represented 60.7% of total IRD traded notional compared to 61.8% in 2019.

In the fourth quarter of 2020:

- In the US, traded notional of OTC IRD referencing alternative RFRs totaled \$3.9 trillion in fourth quarter of 2020, equating to 9.5% of total IRD traded notional. The number of IRD trades referencing alternative RFRs was 12,302, representing 3.6% of total IRD trade count.

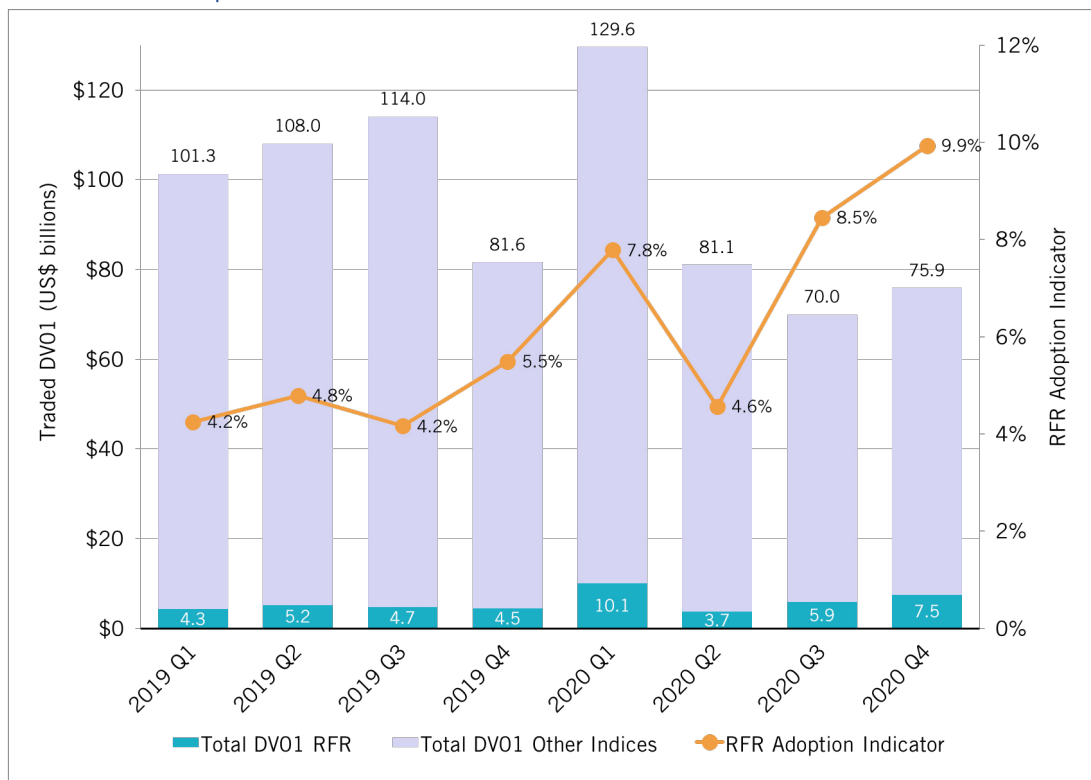
⁶ This is expected as SONIA has been and is currently used as the reference rate for sterling overnight index swaps (OIS), while the effective federal funds rate (EFFR) is still widely used as the reference rate for US dollar OIS

GLOBAL RFR-LINKED OTC AND EXCHANGE-TRADED IRD

The ISDA-Clarus RFR Adoption Indicator increased to 7.6% in the full year 2020 compared to 4.6% in the prior year⁷. RFR-linked IRD DV01 increased to \$27.2 billion in 2020 compared to \$18.7 billion in 2019. Total IRD DV01 decreased to \$356.5 billion from \$404.9 billion over the same period.

In the fourth quarter of 2020, the ISDA-Clarus RFR Adoption Indicator reached 9.9% versus 8.5% in the third quarter. RFR-linked IRD DV01 increased to \$7.5 billion in the fourth quarter of 2020 compared to \$5.9 billion in the prior quarter. Total IRD DV01 increased to \$75.9 billion from \$70.0 billion over the same period⁸ (see Chart 1).

Chart 1: RFR Adoption Indicator: % of DV01 Transacted as RFR-linked IRD Products



Source: ISDA-Clarus RFR Adoption Indicator

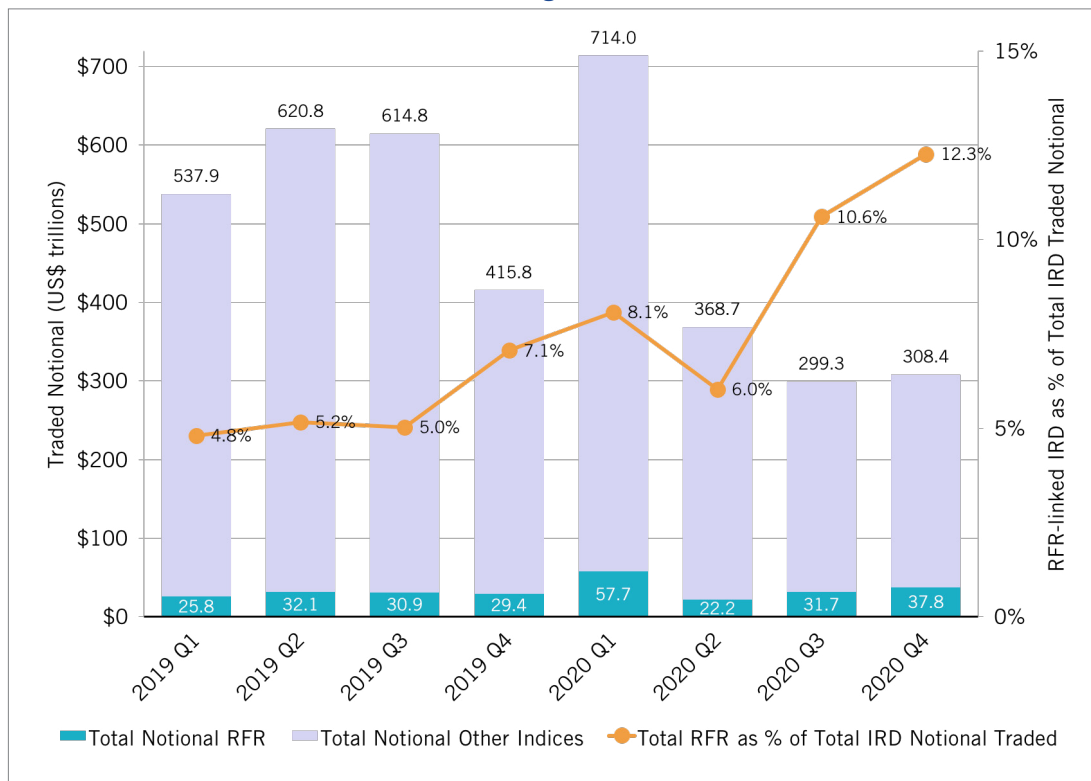
RFR-linked IRD traded notional increased to 8.8% of total IRD traded notional in 2020 versus 5.4% in 2019. RFR-linked IRD traded notional, including OTC and ETD, totaled \$149.5 trillion in 2020 compared to \$118.1 trillion in 2019. Total IRD traded notional declined to \$1,690.4 trillion from \$2,189.3 trillion over the same period.

⁷ ISDA-Clarus RFR Adoption Indicator tracks how much global trading activity (as measured by DV01) is conducted in cleared OTC and exchange-traded derivatives that reference the identified RFRs in six major currencies, including the Australian dollar, euro, sterling, swiss franc, US dollar and yen

⁸ To access interactive charts and download monthly data, go to <https://rfr.clarusft.com>

In the fourth quarter of 2020, RFR-linked IRD traded notional accounted for 12.3% of total IRD traded notional compared to 10.6% in the third quarter. RFR-linked IRD traded notional increased to \$37.8 trillion in the fourth quarter of 2020 from \$31.7 trillion in the prior quarter, while total IRD traded notional increased to \$308.4 trillion from \$299.3 trillion over the same period (see Chart 2).

Chart 2: Global IRD Traded Notional (including OTC and ETD)



Source: ISDA-Clarus RFR Adoption Indicator

RFR-LINKED OTC IRD IN THE US

In the US, OTC IRD traded notional referencing alternative RFRs increased by 114.1% to \$18.7 trillion in 2020 compared to \$8.7 trillion in 2019⁹. The increase was primarily driven by higher trading activity in SONIA-linked derivatives.

RFR transactions accounted for 8.1% of total OTC IRD traded notional in 2020 versus 3.4% in the prior year. The number of trades referencing RFRs increased by 148.2% to 36,098 in 2020. RFR-linked trades accounted for 2.3% of total OTC IRD trade count in 2020 compared to 1.0% in 2019.

In the full year 2020:

- SOFR-linked OTC IRD traded notional increased by 248.3% compared with 2019 and totaled \$1.3 trillion, including \$586.1 billion of basis swaps. Trade count increased by 608.6% over the same period and totaled 9,049, including 3,519 basis swaps¹⁰.
- SONIA-linked IRD traded notional increased by 110.7% to \$17.0 trillion, including \$252.0 billion of basis swaps. Trade count increased by 103.5% to 25,816, including 1,410 basis swaps.
- SARON-linked IRD traded notional increased by 17.7% to \$32.6 billion and trade count grew by 14.9% to 77.
- TONA-linked IRD traded notional decreased by 0.2% versus 2019 and totaled \$249.0 billion, including \$3.1 billion of basis swaps. Trade count increased by 25.2% to 630, including seven basis swaps.
- €STR-linked IRD traded notional and trade count increased to \$85.3 billion and 526, respectively¹¹.

⁹ This data covers only transactions that are required to be disclosed under US regulations

¹⁰ The RFR basis swap data covers all basis swaps with the relevant alternative RFR as one of the underlying assets. This includes alternative RFR/interbank offered rate (IBOR) basis swaps. The IBOR data does not cover any basis swaps. The 'Other' category covers non-alternative RFR/IBOR basis swaps and IRD with reference rates that are not otherwise covered. Basis swaps with the relevant alternative RFR as one of the underlying assets are tracked separately because market participants have specifically identified a robust basis swaps market as key to understanding the economic differences between the alternative RFRs and other rates, including IBORs. A robust and liquid basis swaps market for the alternative RFRs will also support hedging during the transition from IBORs to alternative RFRs

¹¹ €STR swaps started trading in the fourth quarter of 2019

In the fourth quarter of 2020:

OTC IRD traded notional referencing alternative RFRs totaled \$3.9 trillion in fourth quarter of 2020, which accounted for 9.5% of total IRD traded notional. The number of IRD trades referencing alternative RFRs was 12,302, representing 3.6% of total OTC IRD trade count.

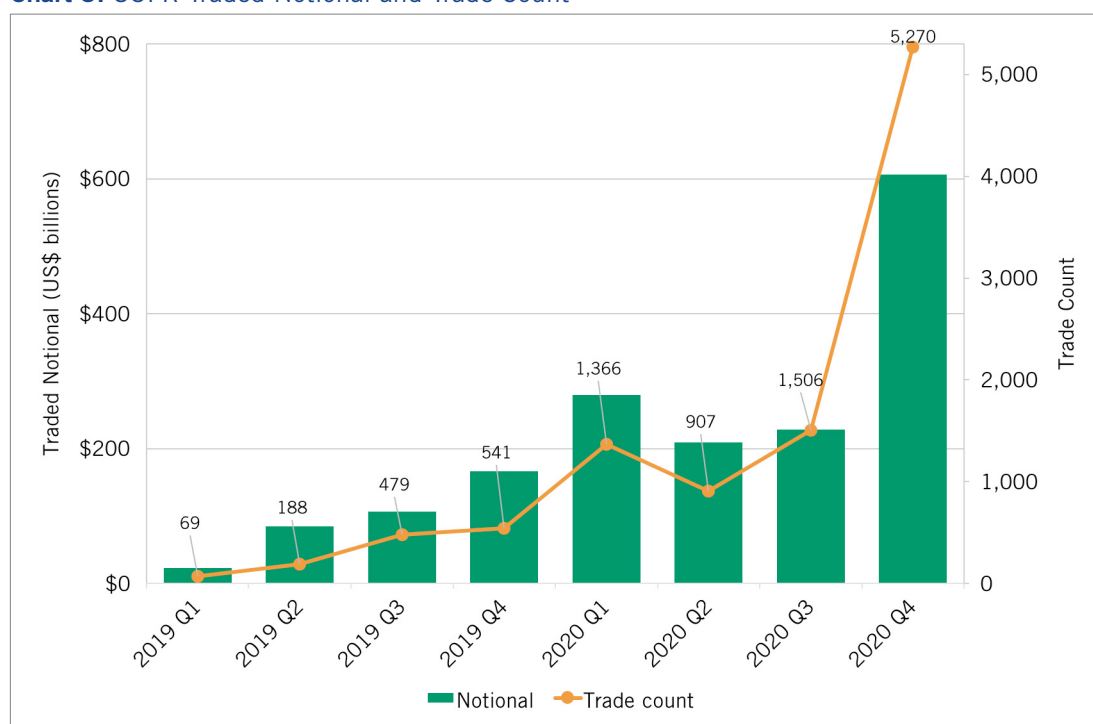
In comparison, traded notional of IRD referencing alternative RFRs totaled \$3.9 trillion in the third quarter of 2020, equating to 8.5% of total IRD traded notional.

- SOFR-linked OTC IRD traded notional increased by 165.9% versus the third quarter of 2020 and totaled \$606.2 billion, including \$246.6 billion of basis swaps. Trade count increased by 249.9% over the same period and totaled 5,270, including 2,231 basis swaps.
- SONIA-linked IRD traded notional decreased by 10.3% to \$3.2 trillion, including \$35.3 billion of basis swaps. Trade count increased by 16.6% to 6,583, including 196 basis swaps.
- SARON-linked IRD traded notional decreased by 75.8% to \$2.5 billion and trade count decreased by 74.1% to seven.
- TONA-linked IRD traded notional grew by 26.8% versus the third quarter of 2020 and totaled \$44.9 billion, including \$3.0 billion of basis swaps. Trade count increased by 19.2% to 118, including four basis swaps.
- €STR-linked IRD traded notional and trade count jumped by 97.8% and 145.5%, respectively. Traded notional was \$47.8 billion, including \$0.1 billion of basis swaps. Trade count totaled 324, including three basis swaps.

SOFR

Trading activity in SOFR-linked OTC IRD grew in the fourth quarter of 2020 compared with the prior three-month period¹². Traded notional of IRD referencing SOFR increased by 165.9% to \$606.2 billion from \$228.0 billion in the third quarter of 2020. The number of SOFR-linked IRD transactions jumped by 249.9% to 5,270 from 1,506 over the same period (see Chart 3).

Chart 3: SOFR Traded Notional and Trade Count



Source: DTCC SDR

Clearing accounted for \$535.5 billion of SOFR-linked IRD in the fourth quarter, including \$228.7 billion of basis swaps. Cleared trades represented 88.3% of total SOFR-linked IRD traded notional¹³.

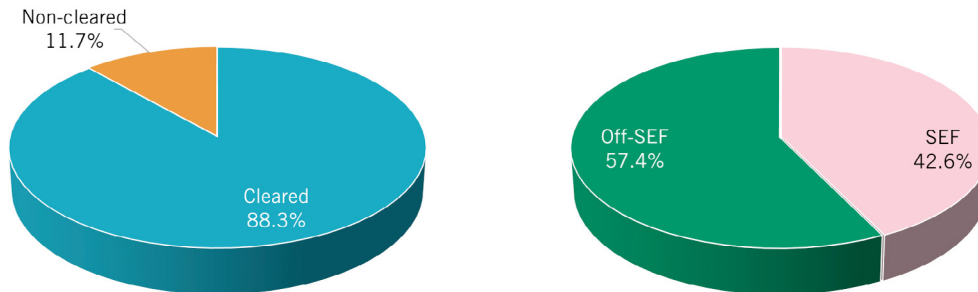
SOFR-linked OTC IRD traded notional transacted on swap execution facilities (SEFs) equaled \$258.3 billion over the same period, representing 42.6% of total SOFR-based IRD traded notional¹⁴. Out of 5,270 SOFR-linked IRD transactions, 2,383 (45.2%) were traded on SEFs (see Chart 4).

¹² SOFR swaps started trading in the third quarter of 2018

¹³ A planned system upgrade by the DTCC SDR on November 21, 2020 changed reporting logic for the cleared status of trades. Following the upgrade, the percentage of trades indicated to be cleared appeared lower than historical averages as firms switched to the new reporting logic. As a result, quarterly and annual clearing rates in this report were calculated based on actual clearing rates up to November 21, and estimated clearing rates from November 21 to December 31, 2020. The estimated clearing rates were calculated by applying the actual clearing rates per product for the period from January 1, 2020 to November 21, 2020 to the traded notional for the period between November 21 and December 31, 2020

¹⁴ A planned system upgrade by the DTCC SDR on November 21, 2020 caused execution venue not to be included in its public price dissemination information. As of December 5, 2020, this issue has been resolved and execution venue type is being published. Missing data was estimated on the SwapsInfo website and in this report, based on actual SEF-execution metrics per product for the period from January 1, 2020 to November 21, 2020

Chart 4: SOFR Traded Notional Q4 2020



Source: DTCC SDR

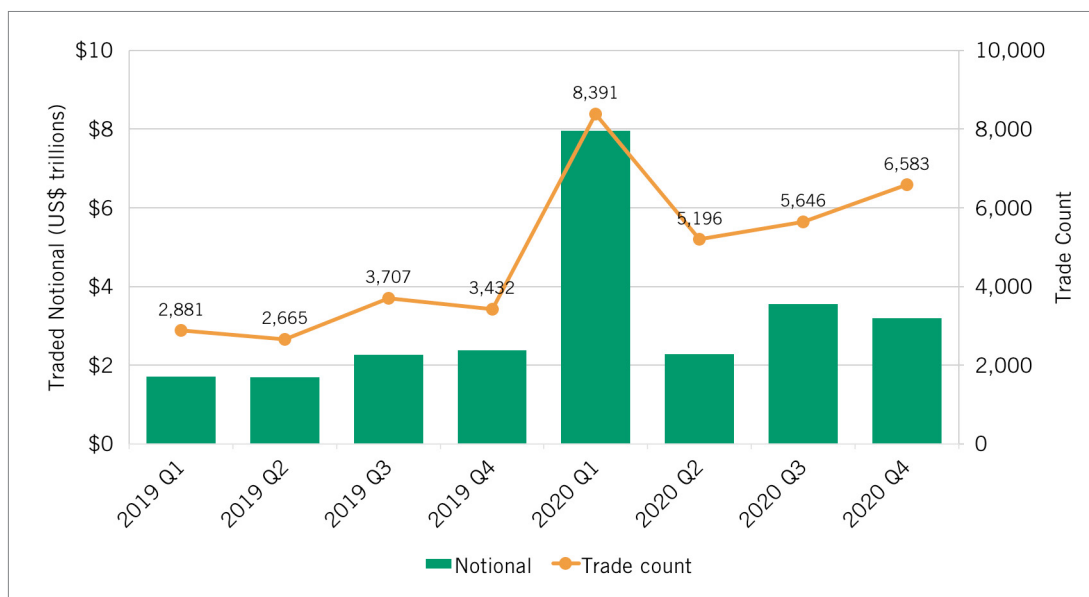
In the full year 2020, SOFR-linked OTC IRD traded notional totaled \$1.3 trillion, including \$586.1 billion of basis swaps. Total trade count was 9,049, including 3,519 basis swaps. In comparison, SOFR-linked IRD traded notional and trade count equaled \$379.9 billion and 1,277, respectively, in 2019.

Clearing accounted for 89.9% of total SOFR-linked IRD traded notional in the full year 2020, totaling \$1.2 trillion. SEF-traded notional was \$415.5 billion, which represented 31.4% of total SOFR-linked IRD traded notional.

SONIA

Traded notional of OTC IRD referencing SONIA declined by 10.3% to \$3.2 trillion in the fourth quarter of 2020 from \$3.6 trillion in the third quarter of 2020. Trade count increased by 16.6%, from 5,646 to 6,583, over the same period (see Chart 5).

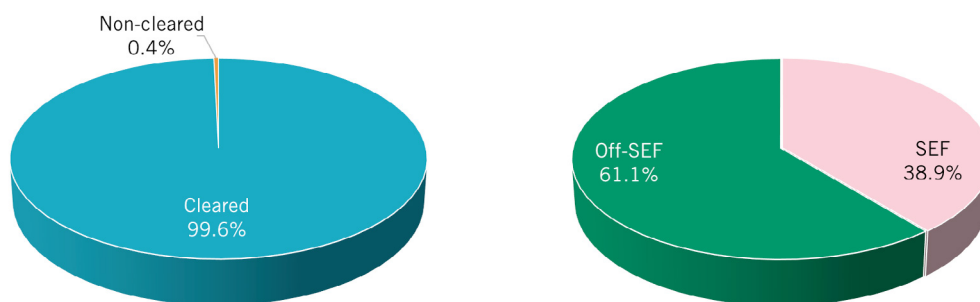
Chart 5: SONIA Traded Notional and Trade Count



Source: DTCC SDR

In the fourth quarter of 2020, \$3.2 trillion of SONIA-linked IRD was cleared, including \$33.6 billion of basis swaps. Cleared transactions accounted for 99.6% of total SONIA-linked IRD traded notional. SEF traded notional equaled \$1.2 trillion and represented 38.9% of total SONIA-linked IRD traded notional (see Chart 6).

Chart 6: SONIA Traded Notional Q4 2020



Source: DTCC SDR

In the full year 2020, SONIA-linked OTC IRD traded notional was \$17.0 trillion, including \$252.0 billion of basis swaps. Total trade count was 25,816, including 1,410 basis swaps. In comparison, SONIA-linked IRD traded notional and trade count totaled \$8.1 trillion and 12,685, respectively, in 2019.

Cleared notional equaled \$16.9 trillion and accounted for 99.5% of total SONIA-linked IRD traded notional in the full year 2020. SEF-traded notional equaled \$4.4 trillion and represented 25.6% of total SONIA-linked IRD traded notional.

Table 1: US IRD Traded Notional and Trade Count

	Q4 2020		Full Year 2020	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count
USD LIBOR	18,148.7	139,926	102,411.4	681,355
SOFR	359.6	3,039	736.9	5,530
Basis Swaps: SOFR	246.6	2,231	586.1	3,519
GBP LIBOR	1,997.1	19,734	12,728.8	114,371
SONIA	3,153.5	6,387	16,727.1	24,406
Basis Swaps: SONIA	35.3	196	252.0	1,410
CHF LIBOR	110.9	2,638	531.1	11,594
SARON	2.5	7	32.6	77
Basis Swaps: SARON	0.0	0	0.0	0
JPY LIBOR	537.6	7,009	3,264.6	34,234
TIBOR/Euroyen TIBOR	1.8	9	7.9	56
TONA	41.9	114	246.0	623
Basis Swaps: TONA	3.0	4	3.1	7
EUR LIBOR	0.4	7	1.9	45
EURIBOR	3,718.2	44,821	21,070.1	201,191
€STR	47.7	321	85.2	523
Basis Swaps: €STR	0.1	3	0.1	3
Other*	12,727.0	114,079	71,886.8	513,664
Total**	41,131.9	340,525	230,571.7	1,592,608

*Other includes IRD with other reference rates and IBOR/non-RFR basis swaps
 **This data includes only the transactions required to be disclosed under U.S. regulations and does not include any exchange-traded derivatives (futures)

Source: DTCC SDR

Table 2: US IRD Traded Notional and Trade Count Q4 2020 vs. Q3 2020

	Q4 2020		Q3 2020		Q4 2020 vs. Q3 2020	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count	Traded Notional	Trade Count
USD LIBOR	18,148.7	139,926	21,266.3	147,547	-14.7%	-5.2%
SOFR	606.2	5,270	228.0	1,506	165.9%	249.9%
GBP LIBOR	1,997.1	19,734	2,859.2	29,125	-30.2%	-32.2%
SONIA	3,188.8	6,583	3,554.9	5,646	-10.3%	16.6%
CHF LIBOR	110.9	2,638	104.3	2,916	6.3%	-9.5%
SARON	2.5	7	10.2	27	-75.8%	-74.1%
JPY LIBOR	537.6	7,009	717.6	7,512	-25.1%	-6.7%
TIBOR/Euroyen TIBOR	1.8	9	1.6	17	9.0%	-47.1%
TONA	44.9	118	35.4	99	26.8%	19.2%
EUR LIBOR	0.4	7	0.5	8	-21.7%	-12.5%
EURIBOR	3,718.2	44,821	4,834.9	45,996	-23.1%	-2.6%
€STR	47.8	324	24.2	132	97.8%	145.5%
Other*	12,727.0	114,079	11,852.1	118,556	7.4%	-3.8%
Total**	41,131.9	340,525	45,489.2	359,087	-9.6%	-5.2%

*Other includes IRD with other reference rates and IBOR/non-RFR basis swaps
**This data includes only the transactions required to be disclosed under US regulations and does not include any exchange-traded derivatives (futures)

Source: DTCC SDR

Table 3: US IRD Traded Notional and Trade Count Full Year 2020 vs. Full Year 2019

	Full Year 2020		Full Year 2019		Full Year 2020 vs. Full Year 2019	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count	Traded Notional	Trade Count
USD LIBOR	102,411.4	681,355	120,425.1	686,693	-15.0%	-0.8%
SOFR	1,323.0	9,049	379.9	1,277	248.3%	608.6%
GBP LIBOR	12,728.8	114,371	10,442.9	91,904	21.9%	24.4%
SONIA	16,979.1	25,816	8,059.2	12,685	110.7%	103.5%
CHF LIBOR	531.1	11,594	619.8	8,747	-14.3%	32.5%
SARON	32.6	77	27.7	67	17.7%	14.9%
JPY LIBOR	3,264.6	34,234	3,977.3	40,079	-17.9%	-14.6%
TIBOR/Euroyen TIBOR	7.9	56	10.5	106	-24.5%	-47.2%
TONA	249.0	630	249.5	503	-0.2%	25.2%
EUR LIBOR	1.9	45	1.11	9	71.8%	400.0%
EURIBOR	21,070.1	201,191	23,099.3	201,595	-8.8%	-0.2%
€STR*	85.3	526	4.7	11	1719.3%	4681.8%
Other**	71,886.8	513,664	89,504.8	454,256	-19.7%	13.1%
Total***	230,571.7	1,592,608	256,801.6	1,497,932	-10.2%	6.3%

*€STR swaps started trading in the fourth quarter of 2019
**Other includes IRD with other reference rates and IBOR/non-RFR basis swaps
***This data includes only the transactions required to be disclosed under U.S. regulations and does not include any exchange-traded derivatives (futures)

Source: DTCC SDR

Table 4: US IRD Cleared and Non-cleared Notional¹⁵

	Q4 2020		Full Year 2020	
	Cleared Notional (US\$ billions)	Non-cleared Notional (US\$ billions)	Cleared Notional (US\$ billions)	Non-cleared Notional (US\$ billions)
USD LIBOR	16,400.7	1,747.9	94,273.3	8,138.1
SOFR	306.9	52.7	641.1	95.8
Basis Swaps: SOFR	228.7	17.9	548.3	37.8
GBP LIBOR	1,803.1	194.0	11,708.2	1,020.6
SONIA	3,142.6	11.0	16,655.2	71.9
Basis Swaps: SONIA	33.6	1.7	231.7	20.2
CHF LIBOR	109.5	1.4	523.8	7.3
SARON	2.44	0.0	32.52	0.1
Basis Swaps: SARON	0.0	0.0	0.0	0.0
JPY LIBOR	503.7	34.0	3,044.5	220.1
TIBOR/Euroyen TIBOR	0.2	1.5	2.6	5.3
TONA	41.5	0.4	241.0	5.0
Basis Swaps: TONA	0.0	3.01	0.0	3.04
EUR LIBOR	0.3	0.1	1.0	0.9
EURIBOR	3,111.6	606.7	18,315.9	2,754.2
€STR	17.9	29.8	42.7	42.4
Basis Swaps: €STR	0.1	0.0	0.1	0.0
Other*	10,728.1	1,998.9	62,138.7	9,748.1
*Other includes IRD with other reference rates and IBOR/non-RFR basis swaps				
**This data includes only the transactions required to be disclosed under U.S. regulations and does not include any exchange-traded derivatives (futures)				

Source: DTCC SDR

¹⁵ A planned system upgrade by the DTCC SDR on November 21, 2020 changed reporting logic for the cleared status of trades. Following the upgrade, the percentage of trades indicated to be cleared appeared lower than historical averages as firms switched to the new reporting logic. As a result, quarterly and annual clearing rates in this report were calculated based on actual clearing rates up to November 21, and estimated clearing rates from November 21 to December 31, 2020. The estimated clearing rates were calculated by applying the actual clearing rates per product for the period from January 1, 2020 to November 21, 2020 to the traded notional for the period between November 21 and December 31, 2020

Table 5: US IRD SEF and Off-SEF Traded Notional¹⁶

	Q4 2020		Full Year 2020	
	SEF Traded Notional (US\$ billions)	Off-SEF Traded Notional (US\$ billions)	SEF Traded Notional (US\$ billions)	Off-SEF Traded Notional (US\$ billions)
USD LIBOR	14,664.4	3,484.3	83,573.4	18,838.0
SOFR	134.2	225.4	180.0	557.0
Basis Swaps: SOFR	124.1	122.4	235.5	350.6
GBP LIBOR	1,118.7	878.4	7,991.6	4,737.2
SONIA	1,234.3	1,919.2	4,328.0	12,399.1
Basis Swaps: SONIA	6.9	28.4	25.1	226.9
CHF LIBOR	61.0	49.8	270.1	261.0
SARON	1.17	1.3	4.66	27.9
Basis Swaps: SARON	0.0	0.0	0.0	0.0
JPY LIBOR	287.6	250.0	2,005.0	1,259.6
TIBOR/Euroyen TIBOR	0.0	1.7	0.4	7.5
TONA	23.0	18.9	172.9	73.0
Basis Swaps: TONA	0.0	3.01	0.0	3.06
EUR LIBOR	0.0	0.4	0.2	1.7
EURIBOR	2,037.7	1,680.6	11,566.4	9,503.7
€STR	7.4	40.3	7.8	77.4
Basis Swaps: €STR	0.0	0.1	0.0	0.1
Other*	4,836.5	7,890.6	27,284.1	44,602.7

*Other includes IRD with other reference rates and IBOR/non-RFR basis swaps
**This data includes only the transactions required to be disclosed under U.S. regulations and does not include any exchange-traded derivatives (futures)

Source: DTCC SDR

Most OTC IRD transactions referencing alternative RFRs had a tenor up to one year¹⁷. For example, out of \$606.2 billion of SOFR-linked IRD traded notional in the fourth quarter of 2020, \$276.4 billion (45.6%) had a tenor up to one year, \$214.2 billion (35.3%) was between one and five years and \$115.7 billion (19.1%) had a tenor over five years (see Table 6).

¹⁶ A planned system upgrade by the DTCC SDR on November 21, 2020 caused execution venue not to be included in its public price dissemination information. As of December 5, 2020, this issue has been resolved and execution venue type is being published. Missing data was estimated on the SwapsInfo website and in this report, based on actual SEF-execution metrics per product for the period from January 1, 2020 to November 21, 2020

¹⁷ Tenor is calculated as the difference between the effective date and the maturity date

Table 6: US RFR-linked IRD Traded Notional and Trade Count by Tenor

	Q4 2020		Full Year 2020	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count
SOFR	606.2	5,270	1,323.0	9,049
Up to 1 year	276.4	365	747.6	1,114
Over 1 year and up to 5 years	214.2	2,449	403.4	4,329
Over 5 years	115.7	2,456	172.1	3,606
SONIA	3,188.8	6,583	16,979.1	25,816
Up to 1 year	2,900.6	1,627	15,965.3	8,065
Over 1 year and up to 5 years	157.2	1,469	552.6	4,785
Over 5 years	131.0	3,487	461.1	12,966
SARON	2.5	7	32.6	77
Up to 1 year	2.4	5	30.2	55
Over 1 year and up to 5 years	0.0	0	1.8	11
Over 5 years	0.1	2	0.6	11
TONA	44.9	118	249.0	630
Up to 1 year	38.8	53	227.4	362
Over 1 year and up to 5 years	3.1	23	13.9	94
Over 5 years	3.0	42	7.8	174
€STR	47.8	324	85.3	526
Up to 1 year	27.7	29	54.8	74
Over 1 year and up to 5 years	13.7	170	20.8	260
Over 5 years	6.4	125	9.7	192

This data includes only the transactions required to be disclosed under US regulations and does not include any exchange-traded derivatives (futures)

Source: DTCC SDR

The majority of RFR-linked OTC IRD traded notional comprised basis swaps and overnight index swaps (OIS). For example, out of 5,270 SOFR-based IRD contracts traded in the fourth quarter of 2020, 2,329 were OIS transactions, 2,231 were basis swaps, 118 were fixed-for-floating interest rate swaps and 518 were cap floor products (see Table 7).

Table 7: US RFR-linked IRD Traded Notional and Trade Count by Product

	Q4 2020		Full Year 2020	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count
SOFR	606.2	5,270	1,323.0	9,049
OIS	327.4	2,329	696.2	4,727
Basis Swaps	246.6	2,231	586.1	3,519
Fixed-for-Floating IRS	9.0	118	12.0	168
Cross Currency IRS	0.0	1	0.0	1
Inflation Swaps	0.0	0	0.0	0
Exotics	2.7	58	7.0	75
Options	2.6	15	2.9	17
Cap Floor	17.9	518	18.8	542
SONIA	3,188.8	6,583	16,979.1	25,816
OIS	3,152.4	6,371	16,681.5	24,270
Basis Swaps	35.3	196	252.0	1,410
Fixed-for-Floating IRS	0.3	2	38.7	45
Cross Currency IRS	0.4	6	0.8	12
Inflation Swaps	0.1	2	0.3	5
Exotics	0.2	5	5.7	73
Options	0.0	0	0.0	0
Cap Floor	0.1	1	0.1	1
SARON	2.5	7	32.6	77
OIS	2.5	7	32.6	77
Basis Swaps	0.0	0	0.0	0
Fixed-for-Floating IRS	0.0	0	0.0	0
Cross Currency IRS	0.0	0	0.0	0
Inflation Swaps	0.0	0	0.0	0
Exotics	0.0	0	0.0	0
Options	0.0	0	0.0	0
Cap Floor	0.0	0	0.0	0
TONA	44.9	118	249.0	630
OIS	41.9	114	244.3	619
Basis Swaps	3.01	4	3.06	7
Fixed-for-Floating IRS	0.0	0	0.0	0
Cross Currency IRS	0.0	0	0.0	0
Inflation Swaps	0.0	0	0.0	0
Exotics	0.0	0	1.6	4
Options	0.0	0	0.0	0
Cap Floor	0.0	0	0.0	0
€STR	47.8	324	85.3	526
OIS	47.4	319	84.9	521
Basis Swaps	0.1	3	0.1	3
Fixed-for-Floating IRS	0.0	0	0.0	0
Cross Currency IRS	0.0	0	0.0	0
Inflation Swaps	0.0	0	0.0	0
Exotics	0.3	2	0.3	2
Options	0.0	0	0.0	0
Cap Floor	0.0	0	0.0	0

This data includes only the transactions required to be disclosed under US regulations and does not include any exchange-traded derivatives (futures)

IBOR-LINKED OTC IRD IN THE US

OTC IRD traded notional referencing LIBOR denominated in US dollars, sterling, Swiss franc, yen and euro, as well as EURIBOR and TIBOR, equaled \$24.5 trillion in the fourth quarter of 2020, representing 59.6% of total IRD traded notional¹⁸. The number of IRD trades referencing IBORs totaled 214,144, accounting for 62.9% of total IRD trade count.

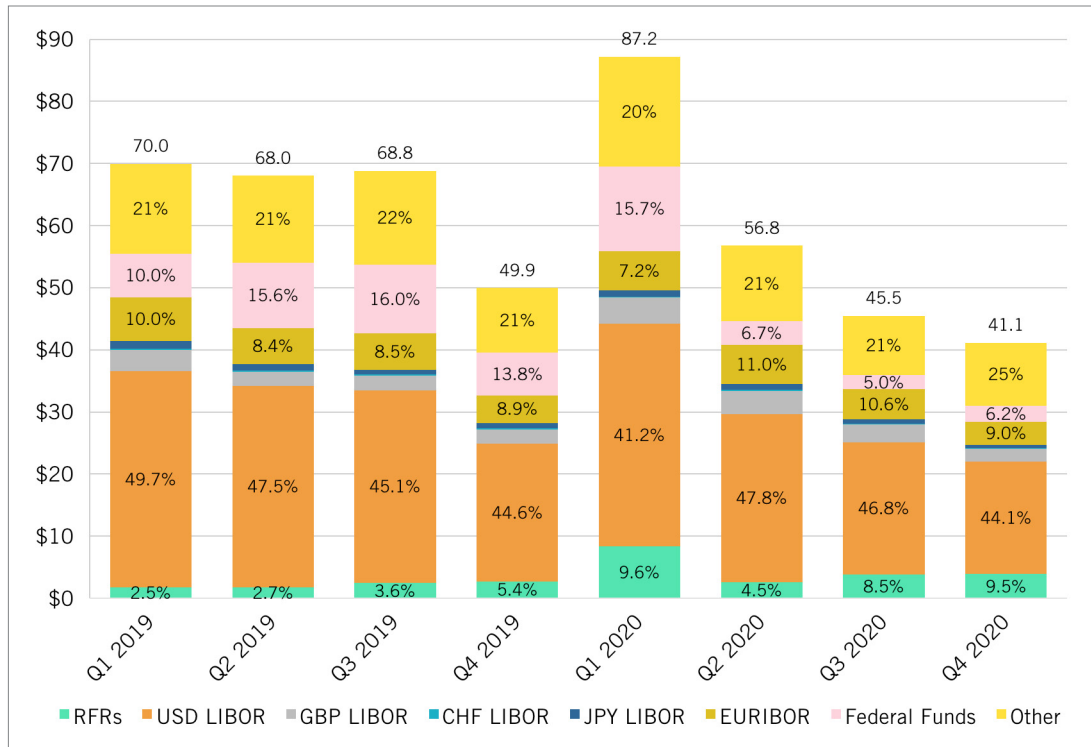
IRD traded notional based on US dollar LIBOR equaled \$18.1 trillion, accounting for 44.1% of total IRD traded notional in the fourth quarter of 2020 (see Chart 7). EURIBOR and sterling LIBOR IRD traded notional was \$3.7 trillion and \$2.0 trillion, respectively. IRD traded notional referencing the Effective Federal Funds Rate totaled \$2.5 trillion and accounted for 6.2% of IRD traded notional.

In comparison, IRD traded notional referencing LIBOR denominated in US dollar, sterling, Swiss franc, yen and euro, as well as EURIBOR and TIBOR, equaled \$29.8 trillion and represented 65.6% of total IRD traded notional in the third quarter of 2020.

In the full year 2020, OTC IRD traded notional referencing IBORs totaled \$140.0 trillion (60.7% of total IRD traded notional) compared to \$158.6 trillion (61.8% of total IRD traded notional) in the full year 2019. The number of trades referencing IBORs totaled 1,042,846 in 2020 compared to 1,029,133 in 2019.

¹⁸ This data covers only transactions that are required to be disclosed under US regulations

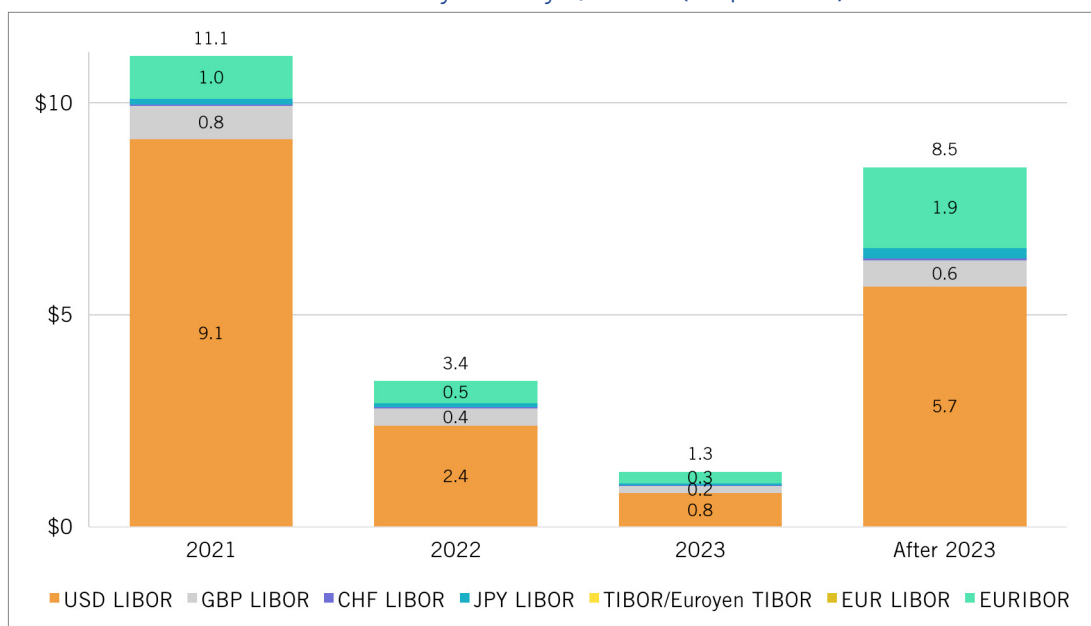
Chart 7: IRD Traded Notional by Underlying Interest Rate Benchmark (US\$ trillions)



Source: DTCC SDR

In the fourth quarter of 2020, \$11.1 trillion of OTC IRD traded notional referencing LIBOR had a 2021 maturity, including \$9.1 trillion based on US dollar LIBOR, \$1.0 trillion based on EURIBOR and \$0.8 trillion based on sterling LIBOR. \$8.5 trillion of LIBOR-linked IRD traded notional had a maturity after 2023, including \$5.7 trillion based on US dollar LIBOR (see Chart 8).

Chart 8: IBOR IRD Traded Notional by Maturity Q4 2020 (US\$ trillions)



Source: DTCC SDR

SOFR AND SONIA FUTURES

Trading volume in SOFR futures increased by 12.0% to \$13.1 trillion in the fourth quarter of 2020 from \$11.7 trillion in the third quarter of 2020 (see Chart 9).

Trading volume in SOFR futures totaled \$45.9 trillion in the full year 2020. Open interest in SOFR futures declined to \$1.6 trillion at the end of December 2020 compared to \$2.1 trillion at the end of December 2019¹⁹.

Chart 9: SOFR Futures Quarterly Trading Volume and Open Interest (Implied Notional in OTC Equivalent)



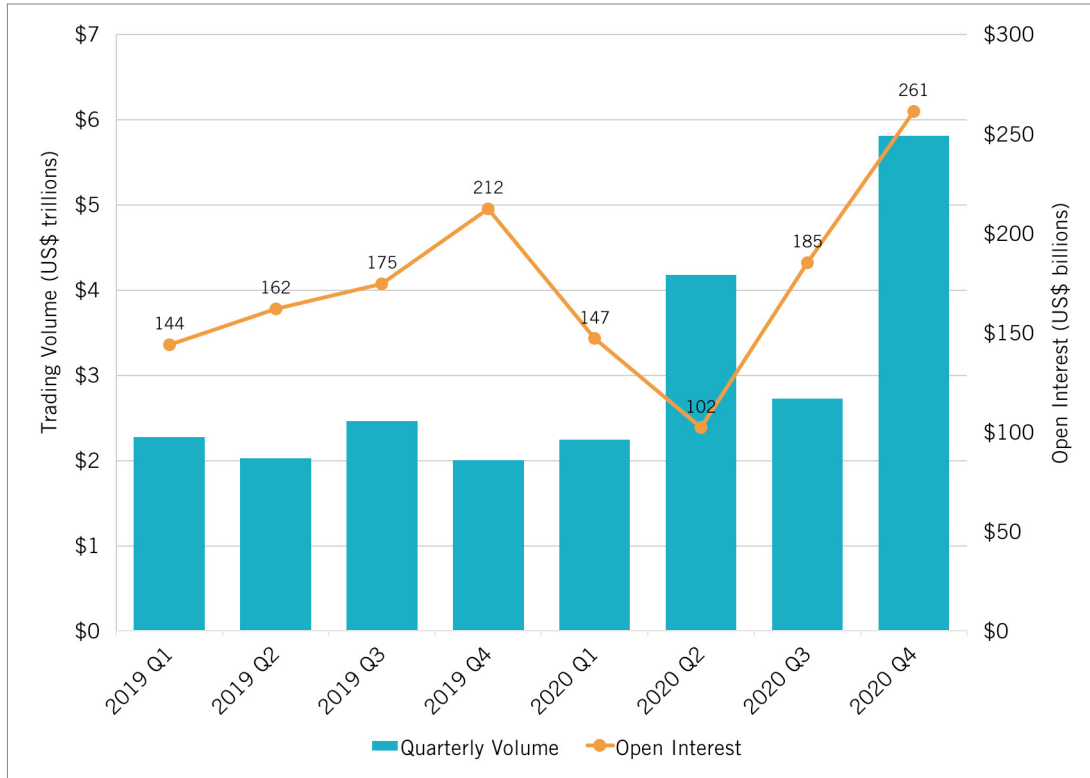
Source: CME and ICE

Trading volume in SONIA futures increased to \$5.8 trillion in the fourth quarter of 2020 from \$2.7 trillion in the previous quarter (see Chart 10).

Trading volume in SONIA futures totaled \$15.0 trillion in the full year 2020. Open interest increased to \$261.3 billion at the end of December 2020 compared with \$212.3 billion at the end of December 2019.

¹⁹ The analysis of trading activity in SOFR and SONIA exchange-traded futures is based on data from CME, ICE and LCH

Chart 10: SONIA Quarterly Trading Volume and Open Interest (Implied Notional in OTC Equivalent)



Source: CME, ICE and LCH



ISDA has published other recent research papers:

- ***ISDA-Clarus RFR Adoption Indicator: December 2020, January 2021***
<https://www.isda.org/a/luBTE/ISDA-Clarus-RFR-Adoption-Indicator-December-2020.pdf>
- ***Evolution of OTC Derivatives Markets Since the Financial Crisis, January 2021***
<https://www.isda.org/a/8jjTE/Evolution-of-OTC-Derivatives-Markets-Since-the-Financial-Crisis.pdf>
- ***Overview of ESG-related Derivatives Products and Transactions, January 2021***
<https://www.isda.org/a/qRpTE/Overview-of-ESG-related-Derivatives-Products-and-Transactions.pdf>

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