

TRANSITION TO RFRs REVIEW: First Quarter of 2021

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 FIRST QUARTER OF 2021

Global Trading Activity¹

The ISDA-Clarus RFR Adoption Indicator decreased to 9.8% in the first quarter of 2021 compared to 9.9% in the fourth quarter of 2020². 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 10.6% of total IRD traded notional in the first quarter of 2021 compared to 12.3% in the prior quarter.

Trading Activity in the US⁴

Traded notional of OTC IRD in the US referencing alternative RFRs increased by 41.1% to \$5.5 trillion in the first quarter of 2021 compared to \$3.9 trillion in the fourth quarter of 2020⁵. The increase was primarily driven by higher trading activity in SONIA-linked derivatives. However, RFR transactions accounted for 7.8% of total IRD traded notional in the first quarter of 2021 compared to 9.5% in the prior quarter.

- IRD traded notional referencing SOFR increased to \$780.7 billion in the first quarter of 2021 from \$620.9 billion in the prior quarter. The proportion of IRD traded notional linked to SOFR remained small, accounting for only 1.1% of total IRD traded notional and 14.1% of IRD traded notional referencing RFRs.

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 The RFR Adoption Indicator was 8.8% in March 2021. ISDA-Clarus RFR Adoption Indicator, March 2021: <https://www.isda.org/a/lqFTE/ISDA-Clarus-RFR-Adoption-Indicator-March-2021.pdf>

³ ISDA-Clarus RFR Adoption Indicator White Paper: <https://www.isda.org/a/SlmTE/ISDA-Clarus-RFR-Adoption-Indicator-Whitepaper.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

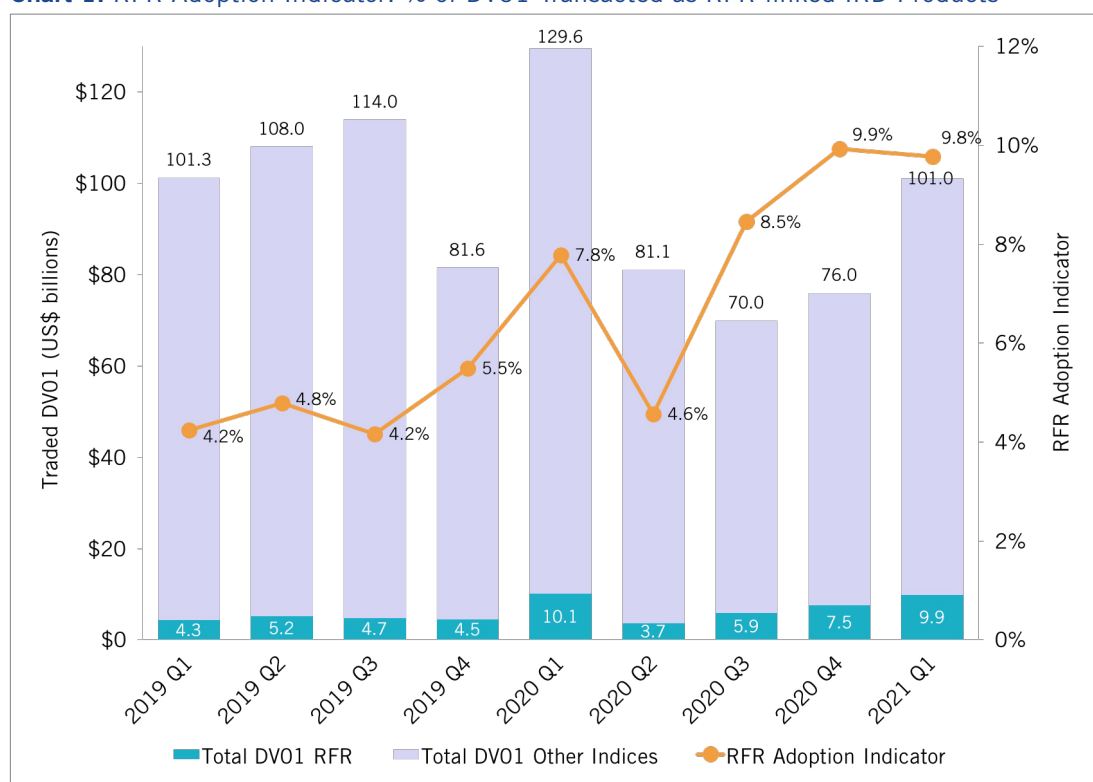
- IRD traded notional referencing SONIA increased to \$4.6 trillion in the first quarter of 2021 compared to \$3.2 trillion in the fourth quarter of 2020. SONIA transactions accounted for 6.5% of total IRD traded notional and represented 83.2% of IRD traded notional referencing RFRs⁶.
 - Traded notional of IRD referencing LIBOR denominated in US dollars, sterling, Swiss franc, yen and euro, as well as EURIBOR and TIBOR, increased to \$51.1 trillion compared to \$25.6 trillion in the fourth quarter of 2020. These interbank offered rates (IBORs) represented 71.7% of total IRD traded notional compared to 62.0% in the fourth quarter of 2020.
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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 decreased to 9.8% in the first quarter of 2021 compared to 9.9% in the fourth quarter of 2020⁷. RFR-linked IRD DV01 increased to \$9.9 billion in the first quarter of 2021 compared to \$7.5 billion in the prior quarter. Total IRD DV01 rose to \$101.0 billion from \$76.0 billion over the same period⁸ (see Chart 1).

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



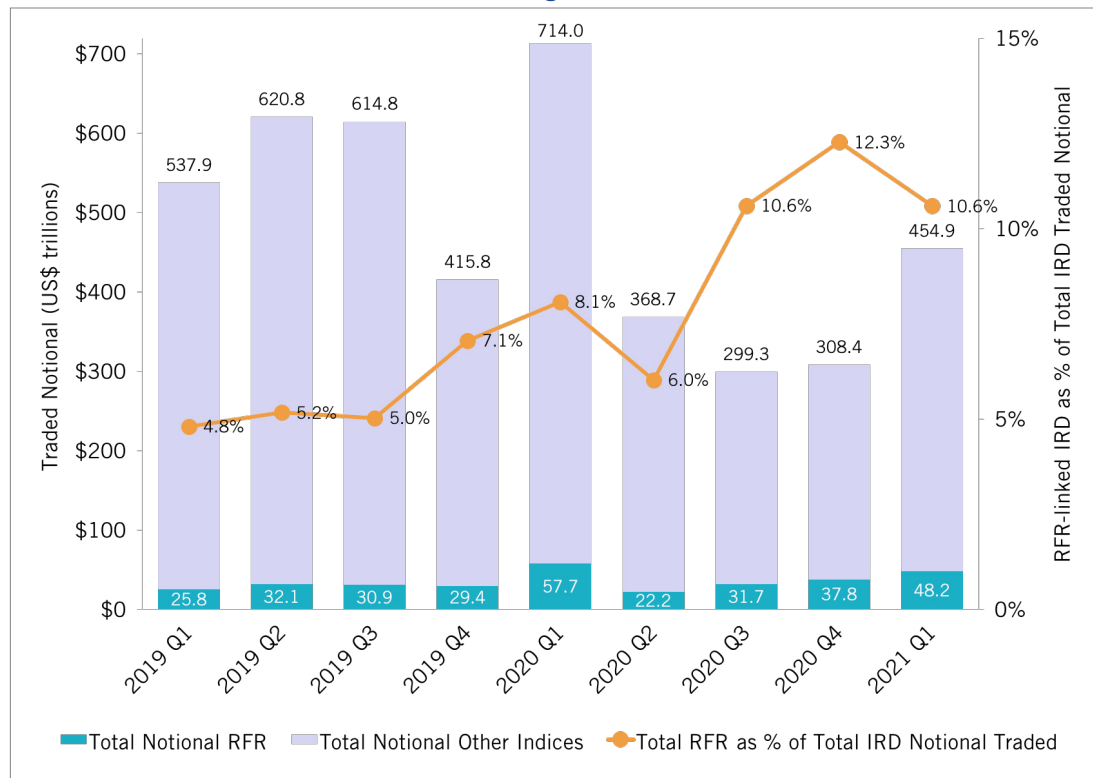
Source: ISDA-Clarus RFR Adoption Indicator

RFR-linked IRD traded notional accounted for 10.6% of total IRD traded notional in the first quarter of 2021 versus 12.3% in the fourth quarter of 2020. IRD traded notional linked to RFRs increased to \$48.2 trillion in the first quarter of 2021 from \$37.8 trillion in the prior quarter. Total IRD traded notional increased to \$454.9 trillion from \$308.4 trillion over the same period (see Chart 2).

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, visit <https://rfr.clarusft.com>

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 41.1% to \$5.5 trillion in the first quarter of 2021 compared to \$3.9 trillion in the fourth quarter of 2020⁹. The increase was primarily driven by higher trading activity in SONIA-linked derivatives.

RFR transactions accounted for 7.8% of total OTC IRD traded notional in the first quarter of 2021 versus 9.5% in the prior quarter. The number of trades referencing RFRs increased by 80.7% to 22,465 in the first quarter of 2021. RFR-linked trades accounted for 4.1% of total OTC IRD trade count in first quarter of 2021 compared to 3.6% in the first quarter of 2020.

In the first quarter of 2021:

- SOFR-linked OTC IRD traded notional increased by 25.7% compared with the fourth quarter of 2020 and totaled \$780.7 billion, including \$353.6 billion of basis swaps. Trade count grew by 4.1% to 5,583 over the same period, including 2,242 basis swaps¹⁰.
- SONIA-linked IRD traded notional increased by 43.7% to \$4.6 trillion, including \$62.8 billion of basis swaps. Trade count rose by 145.8% to 16,280, including 356 basis swaps.
- SARON-linked IRD traded notional increased to \$7.1 billion and trade count grew to 53.
- TONA-linked IRD traded notional grew to \$98.0 billion, including \$0.1 billion of basis swaps. Trade count increased to 220, including two basis swaps.
- €STR-linked IRD traded notional decreased by 7.7% to \$44.0 billion, including \$0.4 billion of basis swaps. Trade count grew to 329, including seven basis swaps¹¹.

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

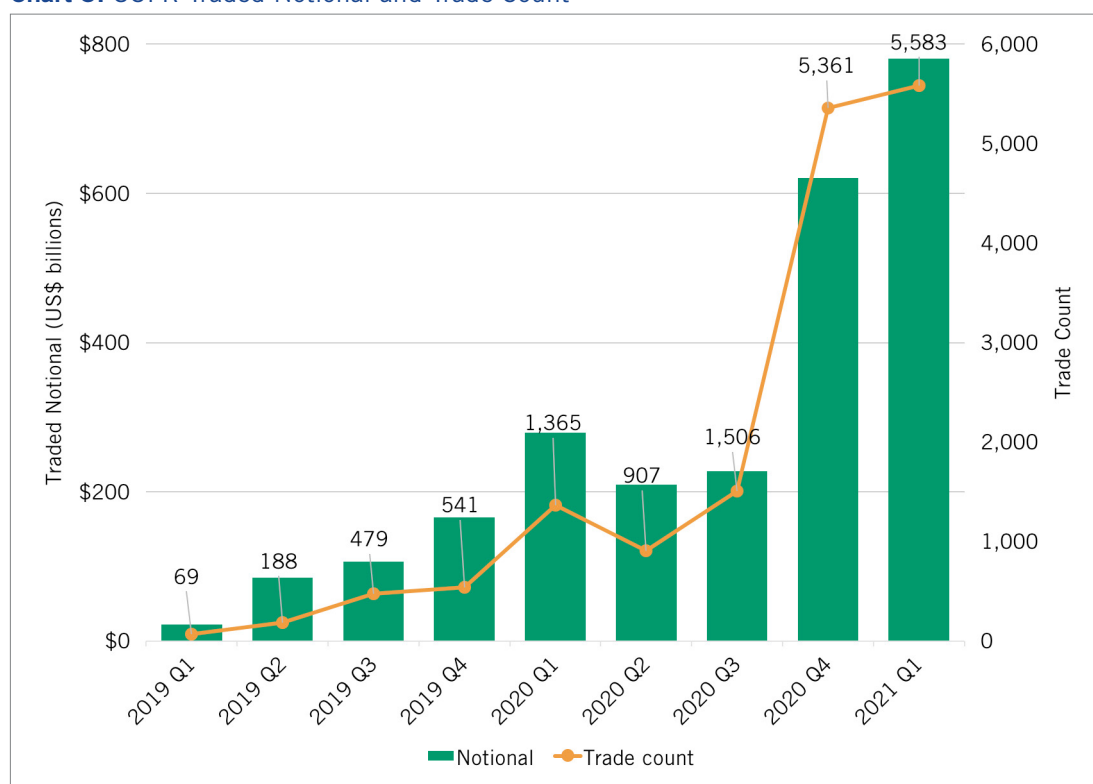
¹⁰ The RFR basis swap data covers all basis swaps with the relevant alternative RFR as one of the underlying assets. This includes alternative RFR/interbank offered rate (IBOR) basis swaps. Basis swaps with the relevant alternative RFR as one of the underlying assets are tracked separately because market 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

SOFR

Trading activity in SOFR-linked OTC IRD grew in the first quarter of 2021 compared to the prior quarter¹². Traded notional of IRD referencing SOFR increased by 25.7% to \$780.7 billion from \$620.9 billion in the fourth quarter of 2020. The number of SOFR-linked IRD transactions increased by 4.1% to 5,583 from 5,361 over the same period (see Chart 3).

Chart 3: SOFR Traded Notional and Trade Count



Source: DTCC SDR

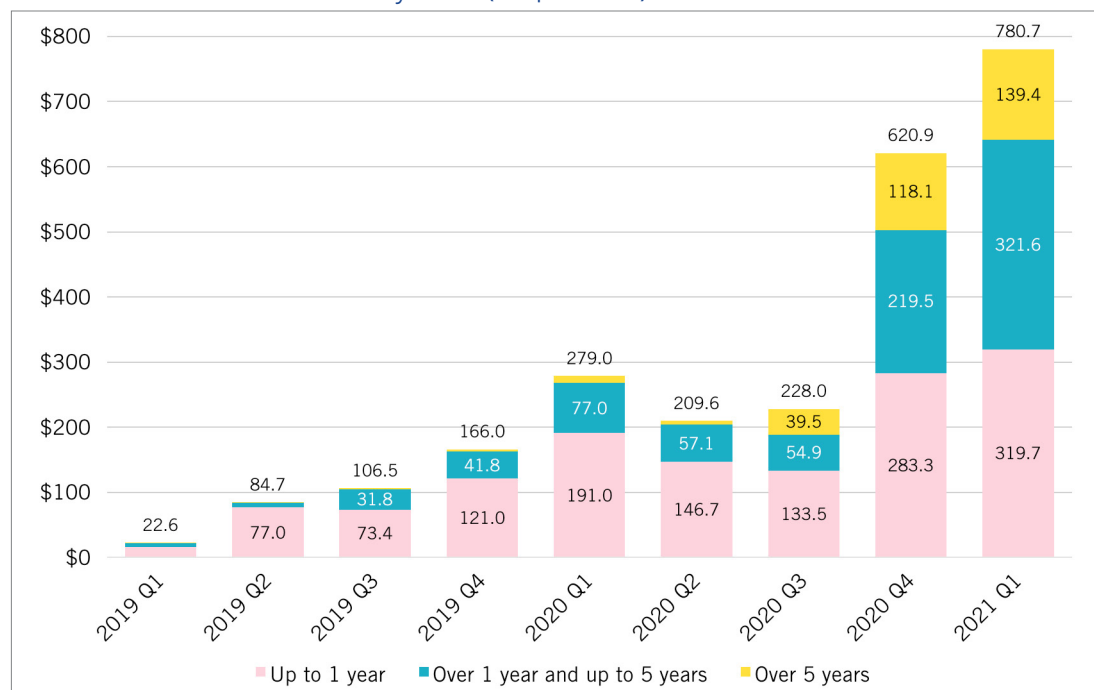
Before major central counterparties changed their price alignment interest/amount and discounting curves from the Effective Federal Funds Rate (EFFR) to SOFR in October 2020, most OTC IRD transactions referencing SOFR had a tenor up to one year¹³. After the change, the tenor of SOFR swaps was extended and more liquidity was created across the entire SOFR curve.

Of the \$780.7 billion of SOFR-linked IRD traded notional in the first quarter of 2021, \$319.7 billion (41.0%) had a tenor up to one year, \$321.6 billion (41.2%) was between one and five years and \$139.4 billion (17.9%) had a tenor over five years (see Chart 4).

¹² SOFR swaps started trading in the third quarter of 2018

¹³ Tenor is calculated as the difference between the effective date and the maturity date

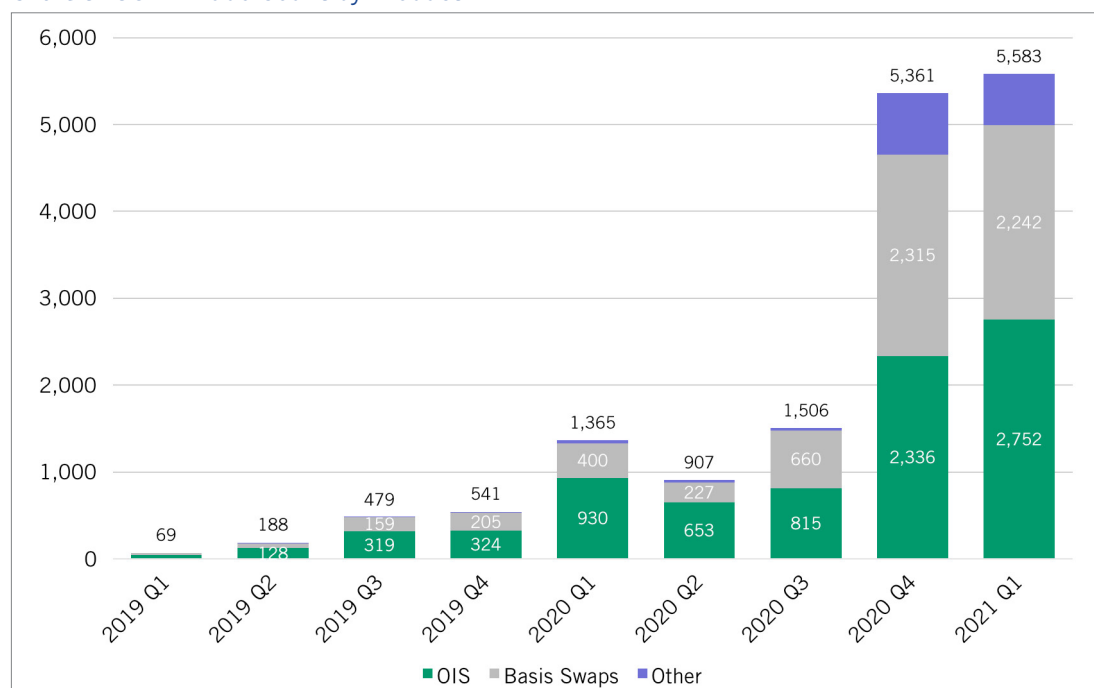
Chart 4: SOFR Traded Notional by Tenor (US\$ billions)



Source: DTCC SDR

Of the 5,583 SOFR-based IRD contracts traded in the first quarter of 2021, 2,752 were overnight index swaps (OIS), 2,242 were basis swaps and 418 were other transactions, including fixed-for-floating interest rate swaps and cap/floor products (see Chart 5).

Chart 5: SOFR Trade Count by Product

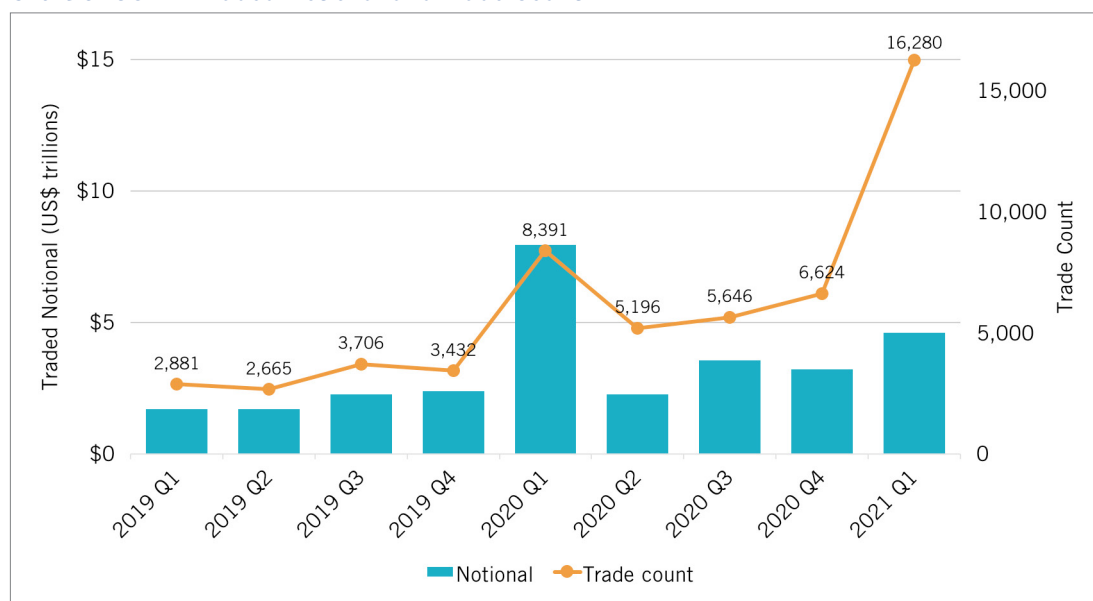


Source: DTCC SDR

SONIA

Traded notional of OTC IRD referencing SONIA increased by 43.7% to \$4.6 trillion in the first quarter of 2021 from \$3.2 trillion in the fourth quarter of 2020. Trade count jumped from 6,624 to 16,280 over the same period (see Chart 6).

Chart 6: SONIA Traded Notional and Trade Count



Source: DTCC SDR

Most transactions referencing SONIA had a tenor up to one year. Of the \$4.6 trillion of SONIA-linked IRD traded notional in the first quarter of 2021, \$3.7 trillion (79.4%) had a tenor up to one year, \$542.9 billion (11.8%) was between one and five years and \$405.6 billion (8.8%) had a tenor over five years (see Chart 7).

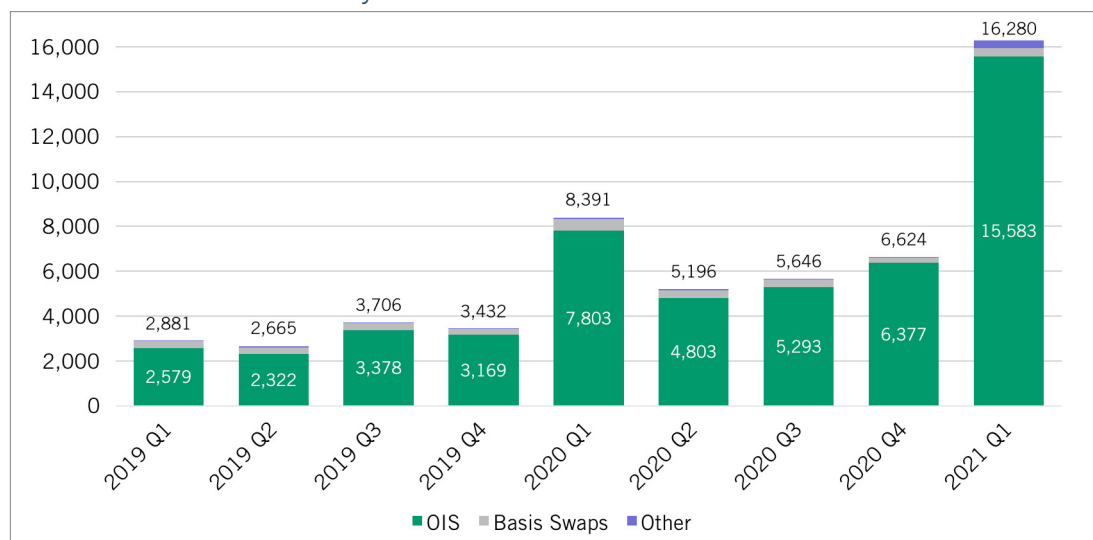
Chart 7: SONIA Traded Notional by Tenor (US\$ trillions)



Source: DTCC SDR

OIS accounted for the majority of SONIA-linked OTC IRD trade count. Of the 16,280 SONIA-based IRD contracts traded in the first quarter of 2021, 15,583 were OIS transactions, 356 were basis swaps and 341 were other products (see Chart 8).

Chart 8: SONIA Trade Count by Product



Source: DTCC SDR

Table 1: US IRD Traded Notional and Trade Count

	Q1 2021		YTD Q1 2021	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count
USD LIBOR	32,255.1	208,429	32,255.1	208,429
SOFR	427.1	3,341	427.1	3,341
Basis Swaps: SOFR	353.6	2,242	353.6	2,242
GBP LIBOR	5,489.5	38,225	5,489.5	38,225
SONIA	4,550.5	15,924	4,550.5	15,924
Basis Swaps: SONIA	62.8	356	62.8	356
CHF LIBOR	241.2	3,712	241.2	3,712
SARON	7.1	53	7.1	53
Basis Swaps: SARON	0.0	0	0.0	0
JPY LIBOR	1,272.3	13,552	1,272.3	13,552
TIBOR/Euroyen TIBOR	1.4	20	1.4	20
TONA	98.0	218	98.0	218
Basis Swaps: TONA	0.1	2	0.1	2
EUR LIBOR	0.8	10	0.8	10
EURIBOR	11,808.0	97,288	11,808.0	97,288
€STR	44.0	322	44.0	322
Basis Swaps: €STR	0.4	7	0.4	7
Other*	14,585.7	165,943	14,585.7	165,943
Total**	71,197.6	549,644	71,197.6	549,644

*Other includes IRD with other reference rates, IBOR/non-RFR basis swaps and IBOR/IBOR basis swaps that reference different IBORs; IBOR/IBOR basis swaps that reference the same IBOR are included in a corresponding IBOR category
**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 Q1 2021 vs. Q4 2020

	Q1 2021		Q4 2020		Q1 2021 vs. Q4 2020	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count	Traded Notional	Trade Count
USD LIBOR	32,255.1	208,429	18,933.4	142,790	70.4%	46.0%
SOFR	780.7	5,583	620.9	5,361	25.7%	4.1%
GBP LIBOR	5,489.5	38,225	2,222.3	20,092	147.0%	90.2%
SONIA	4,613.3	16,280	3,211.2	6,624	43.7%	145.8%
CHF LIBOR	241.2	3,712	112.6	2,657	114.1%	39.7%
SARON	7.1	53	2.5	7	187.9%	657.1%
JPY LIBOR	1,272.3	13,552	556.5	7,205	128.6%	88.1%
TIBOR/Euroyen TIBOR	1.4	20	1.8	9	-20.3%	122.2%
TONA	98.0	220	45.0	117	117.9%	88.0%
EUR LIBOR	0.8	10	0.4	7	126.4%	42.9%
EURIBOR	11,808.0	97,288	3,765.5	44,939	213.6%	116.5%
€STR	44.4	329	48.1	325	-7.7%	1.2%
Other*	14,585.7	165,943	11,740.9	110,740	24.2%	49.8%
Total**	71,197.6	549,644	41,260.9	340,873	72.6%	61.2%

*Other includes IRD with other reference rates, IBOR/non-RFR basis swaps and IBOR/IBOR basis swaps that reference different IBORs; IBOR/IBOR basis swaps that reference the same IBOR are included in a corresponding IBOR category
**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 3: US IRD Traded Notional and Trade Count Q1 2021 vs. Q1 2020

	Q1 2021		Q1 2020		Q1 2021 vs. Q1 2020	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count	Traded Notional	Trade Count
USD LIBOR	32,255.1	208,429	37,068.5	216,588	87.0%	96.2%
SOFR	780.7	5,583	279.0	1,365	279.5%	409.0%
GBP LIBOR	5,489.5	38,225	4,367.1	32,172	125.7%	118.8%
SONIA	4,613.3	16,280	7,958.6	8,391	58.0%	194.0%
CHF LIBOR	241.2	3,712	158.8	2,923	147.8%	127.0%
SARON	7.1	53	7.5	17	82.6%	311.8%
JPY LIBOR	1,272.3	13,552	1,038.0	10,855	122.5%	124.8%
TIBOR/Euroyen TIBOR	1.4	20	1.1	17	49.6%	117.6%
TONA	98.0	220	110.9	252	88.0%	87.3%
EUR LIBOR	0.8	10	0.6	14	-52.6%	71.4%
EURIBOR	11,808.0	97,288	6,272.9	60,054	188.2%	162.0%
€STR	44.4	329	4.3	34	1030.7%	967.6%
Other*	14,585.7	165,943	29,924.0	149,422	48.7%	111.1%
Total**	71,197.6	549,644	87,191.2	482,104	81.7%	114.0%

*Other includes IRD with other reference rates, IBOR/non-RFR basis swaps and IBOR/IBOR basis swaps that reference different IBORs; IBOR/IBOR basis swaps that reference the same IBOR are included in a corresponding IBOR category

**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 RFR-linked IRD Traded Notional and Trade Count by Tenor

	Q1 2021		YTD Q1 2021	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count
SOFR	780.7	5,583	780.7	5,583
Up to 1 year	319.7	339	319.7	339
Over 1 year and up to 5 years	321.6	2,762	321.6	2,762
Over 5 years	139.4	2,482	139.4	2,482
SONIA	4,613.3	16,280	4,613.3	16,280
Up to 1 year	3,664.7	2,467	3,664.7	2,467
Over 1 year and up to 5 years	542.9	4,421	542.9	4,421
Over 5 years	405.6	9,392	405.6	9,392
SARON	7.1	53	7.1	53
Up to 1 year	4.2	12	4.2	12
Over 1 year and up to 5 years	2.3	24	2.3	24
Over 5 years	0.6	17	0.6	17
TONA	98.0	220	98.0	220
Up to 1 year	91.0	153	91.0	153
Over 1 year and up to 5 years	6.0	39	6.0	39
Over 5 years	1.0	28	1.0	28
€STR	44.4	329	44.4	329
Up to 1 year	26.5	44	26.5	44
Over 1 year and up to 5 years	11.1	134	11.1	134
Over 5 years	6.8	151	6.8	151

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

	Q1 2021		YTD Q1 2021	
	Traded Notional (US\$ billions)	Trade Count	Traded Notional (US\$ billions)	Trade Count
SOFR	780.7	5,583	780.7	5,583
OIS	404.7	2,752	404.7	2,752
Basis Swaps	353.6	2,242	353.6	2,242
Fixed-for-Floating IRS	2.7	48	2.7	48
Cross Currency IRS	0.2	8	0.2	8
Inflation Swaps	0.0	0	0.0	0
Exotics	4.9	132	4.9	132
Options	5.8	31	5.8	31
Cap Floor	8.9	370	8.9	370
SONIA	4,613.3	16,280	4,613.3	16,280
OIS	4,501.5	15,583	4,501.5	15,583
Basis Swaps	62.8	356	62.8	356
Fixed-for-Floating IRS	0.2	2	0.2	2
Cross Currency IRS	0.5	6	0.5	6
Inflation Swaps	0.0	0	0.0	0
Exotics	1.7	18	1.7	18
Options	45.4	302	45.4	302
Cap Floor	1.3	13	1.3	13
SARON	7.1	53	7.1	53
OIS	7.1	53	7.1	53
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	98.0	220	98.0	220
OIS	97.9	217	97.9	217
Basis Swaps	0.07	2	0.07	2
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	1	0.0	1
Cap Floor	0.0	0	0.0	0
€STR	44.4	329	44.4	329
OIS	44.0	322	44.0	322
Basis Swaps	0.4	7	0.4	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	0.0	0
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)

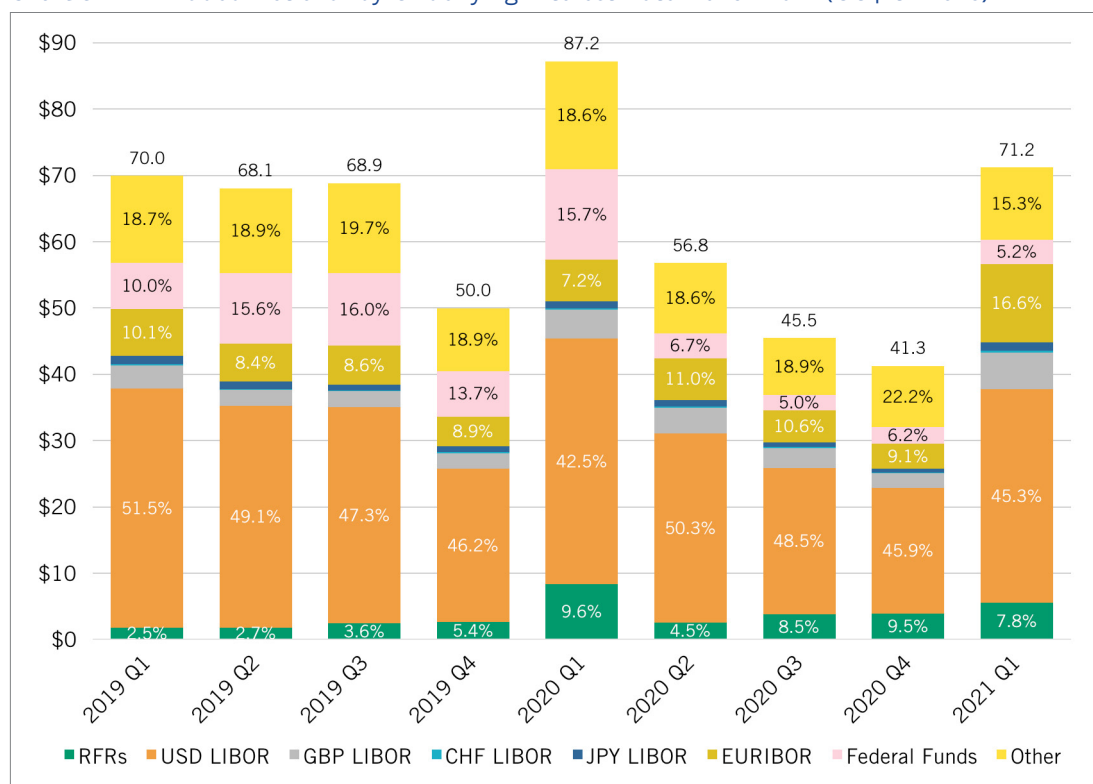
IBOR-LINKED OTC IRD IN THE US

OTC IRD traded notional referencing LIBOR denominated in US dollars, sterling, Swiss franc, yen and euro, as well as EURIBOR and TIBOR, equaled \$51.1 trillion in the first quarter of 2021, representing 71.7% of total IRD traded notional¹⁴. The number of IRD trades referencing IBORs was 361,236, accounting for 65.7% of total IRD trade count.

IRD traded notional based on US dollar LIBOR equaled \$32.3 trillion, accounting for 45.3% of total IRD traded notional in the first quarter of 2021 (see Chart 9). EURIBOR and sterling LIBOR IRD traded notional was \$11.8 trillion and \$5.5 trillion, respectively. IRD traded notional referencing the EFRF totaled \$3.7 trillion and accounted for 5.2% 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 \$25.6 trillion and represented 62.0% of total IRD traded notional in the fourth quarter of 2020¹⁵.

Chart 9: IRD Traded Notional by Underlying Interest Rate Benchmark (US\$ trillions)



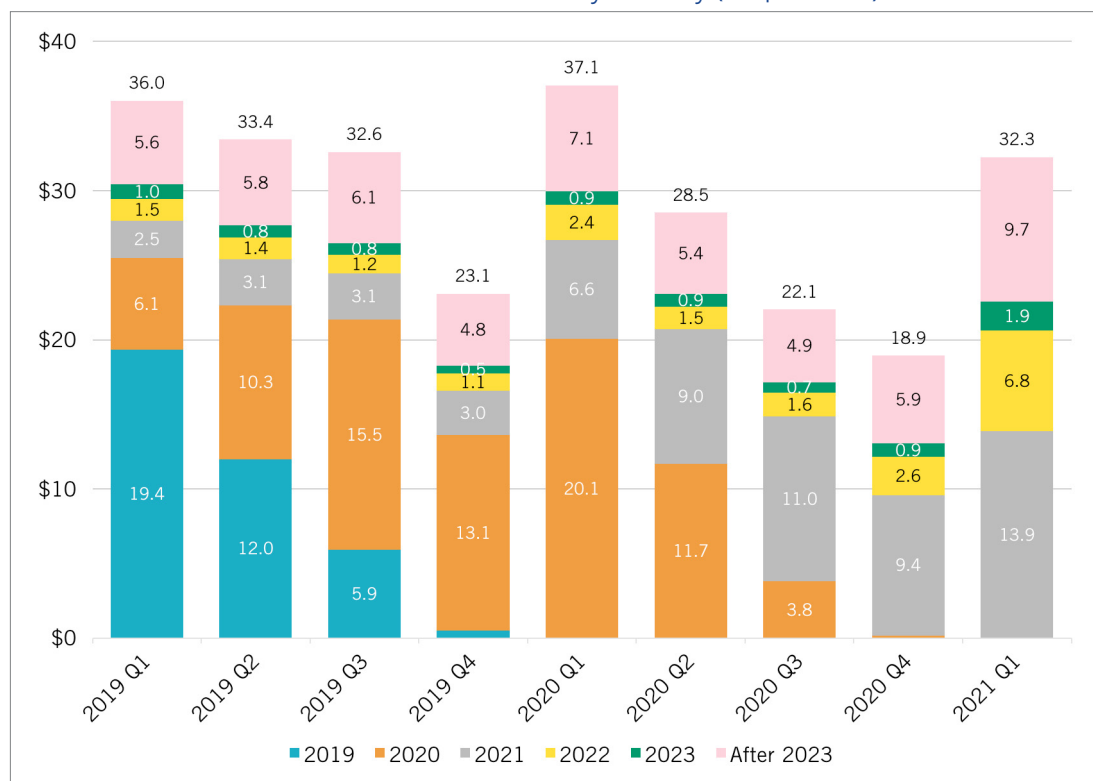
Source: DTCC SDR

¹⁴ This data covers only transactions that are required to be disclosed under US regulations

¹⁵ These numbers are marginally different from the ones published in the prior quarter report due to reclassification of IBOR/IBOR basis swaps that reference the same IBOR from Other to a corresponding IBOR category. Other includes IRD with non-RFR reference rates, IBOR/non-RFR basis swaps and IBOR/IBOR basis swaps that reference different IBORs

Of the \$32.3 trillion of US dollar LIBOR-linked IRD traded notional in the first quarter of 2021, \$13.9 trillion had a 2021 maturity, while \$9.7 trillion had a maturity after 2023 (see Chart 10).

Chart 10: US dollar LIBOR IRD Traded Notional by Maturity (US\$ trillions)



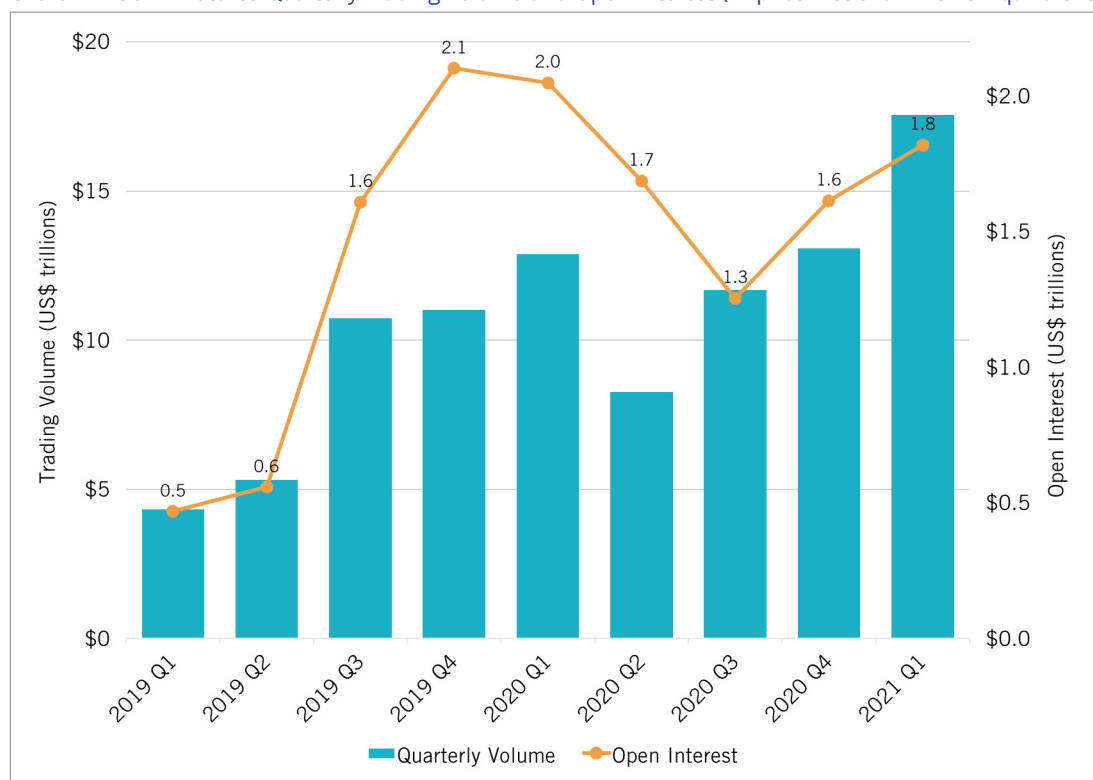
Source: DTCC SDR

SOFR AND SONIA FUTURES

Trading volume in SOFR futures increased by 34.1% to \$17.5 trillion in the first quarter of 2021 from \$13.1 trillion in the fourth quarter of 2020 (see Chart 11).

Open interest in SOFR futures increased to \$1.8 trillion at the end of March 2021 compared to \$1.6 trillion at the end of December 2020¹⁶.

Chart 11: SOFR Futures Quarterly Trading Volume and Open Interest (Implied Notional in OTC Equivalent)



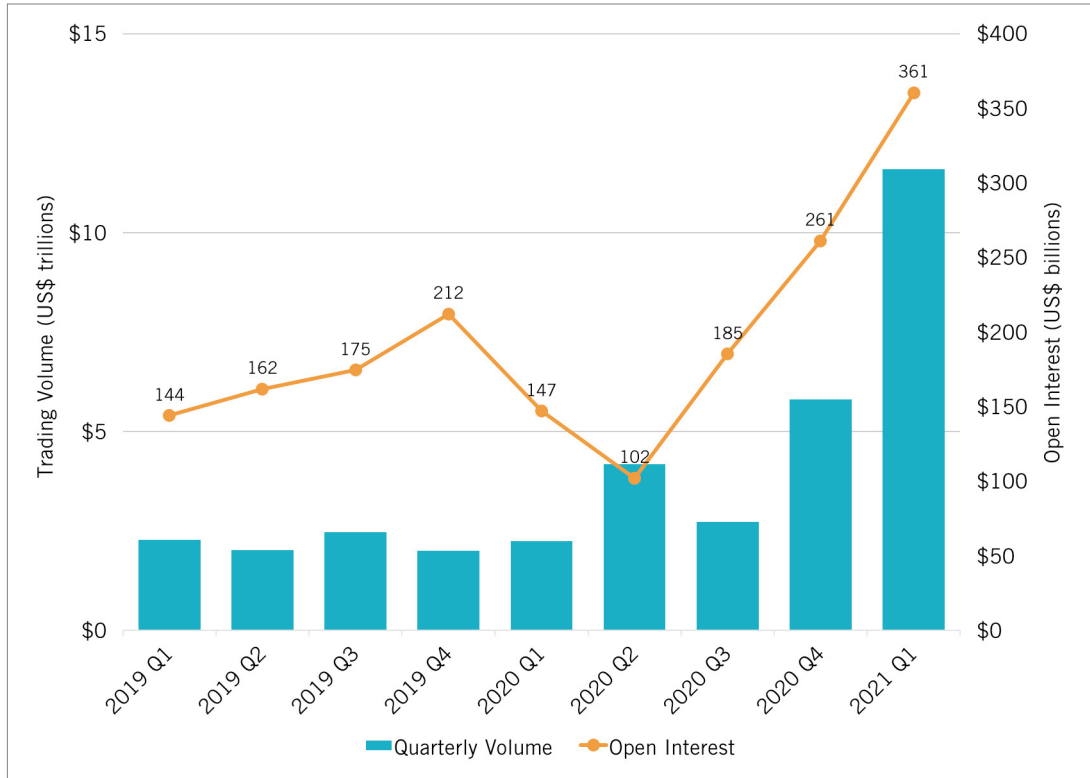
Source: CME and ICE

Trading volume in SONIA futures increased to \$11.6 trillion in the first quarter of 2021 from \$5.8 trillion in the previous quarter (see Chart 12).

Open interest increased to \$360.6 billion at the end of March 2021 compared to \$261.3 billion at the end of December 2020.

¹⁶ The analysis of trading activity in SOFR and SONIA exchange-traded futures is based on data from CME, ICE and LCH

Chart 12: SONIA Futures Quarterly Trading Volume and Open Interest (Implied Notional in OTC Equivalent)



Source: CME, ICE and LCH



ISDA has published other recent research papers:

- ***Adoption of RFRs: Major Developments in 2021, April 2021***

<https://www.isda.org/a/MzFTE/Adoption-of-RFRs-Major-Developments-in-2021.pdf>

- ***ISDA-Clarus RFR Adoption Indicator: March 2021, April 2021***

<https://www.isda.org/a/lqFTE/ISDA-Clarus-RFR-Adoption-Indicator-March-2021.pdf>

- ***Transition to RFRs Review: Full Year 2020 and the Fourth Quarter of 2020, January 2021***

<https://www.isda.org/a/ZqCTE/Transition-to-RFRs-Review-Full-Year-2020-and-Q4-of-2020.pdf>

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Today, ISDA has over 925 member institutions from 75 countries. These members comprise a broad range of derivatives market participants, including corporations, investment managers, government and supranational entities, insurance companies, energy and commodities firms, and international and regional banks. In addition

to market participants, members also include key components of the derivatives market infrastructure, such as exchanges, intermediaries, clearing houses and repositories, as well as law firms, accounting firms and other service providers. Information about ISDA and its activities is available on the Association's website: www.isda.org. Follow us on [Twitter](#), [LinkedIn](#), [Facebook](#) and [YouTube](#).