

# Secured Overnight Funding Rate (SOFR)

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# Agenda

- 1 The ARRC and Recent Developments in Short-Term Interest Rate Benchmarks
- 2 Secured Overnight Funding Rate (SOFR) as a New Reference Rate
- 3 SOFR Futures: Design Considerations and Applications

# Alternative Reference Rates Committee

- The Financial Stability Board (FSB) is an international body that monitors and makes recommendations about the global financial system. In mid-2014, FSB initiated a global effort to review and reform interest rate benchmarks across all jurisdictions, with the goal of making benchmarks more firmly grounded in transactions
- In accord with FSB's initiative, the Federal Reserve convened the ARRC in November 2014

ARRC Participants	ARRC Responsibilities
<p>15 major OTC derivative dealer banks (voting members)</p> <p>5 market infrastructure providers, including CME Group (non-voting members)</p> <p>Board of Governors of the Federal Reserve System Federal Reserve Bank of New York (FRBNY) US Treasury Department Commodity Futures Trading Commission</p>	<p><b>1. Identify a set of alternative reference interest rates that are:</b></p> <ul style="list-style-type: none"><li>• firmly based on transactions from a robust underlying market</li><li>• compliant with emerging standards such as IOSCO Principles for Financial Benchmarks</li></ul> <p><b>2. Identify adoption plan to facilitate acceptance and use of these alternative reference rates.</b> Consider best practices for robust contract design that ensure that contracts are resilient to possible cessation or material alteration of existing or new interest rate benchmarks.</p>

- For additional regulatory and ARRC background, please visit [www.newyorkfed.org/arrc](http://www.newyorkfed.org/arrc)

# ARRC and Recent Developments in STIR Benchmarks

- **Recent events have intensified the focus of our clients on the path forward for CME short-term interest rate products**
  - June 22: After extensive research, ARRC endorses SOFR as US alternative reference rate
  - July 26: CME announces it will develop and list SOFR futures and options
  - July 27: Speech by FCA Chief Executive Andrew Bailey on the future of LIBOR
  
- **CME Group has been deeply involved in developments on this front for several years**
  - Member of LIBOR Oversight Committee since April 2013
  - Non-Voting Member of ARRC since September 2015
  - Participant in ISDA Working Group on Benchmark Fallbacks
  - Published White Paper: What's Next for LIBOR and Eurodollar Futures?

# SOFR, LIBOR, and EFFR

- The FCA July 27 speech clearly states there is no set end date for LIBOR publication
- Given continued reform of LIBOR by IBA Ltd and the essential role of USD LIBOR in \$180 trillion\* assets, we expect banking industry to maintain support of LIBOR publication beyond 2021
- CME has been investigating creation of futures and options on Treasury repo indices since 2013
- SOFR is financially distinct but correlated with both LIBOR and the daily effective federal funds rate (EFFR)
- We expect new SOFR futures to complement our existing futures, options, and cleared swaps, providing:
  - Enhanced risk management tools through additional instruments
  - Price discovery, including determination of essential term SOFR rates
  - Capital efficiencies through margin offsets against Eurodollar, Fed Fund futures, and Treasury Note and Bond futures, as well as portfolio margining offsets against cleared interest rate swaps
  - Execution efficiencies through futures inter-commodity spreads (ICS) on CME Globex

\*2014 FSB Market Participant Group report valued assets backed by USD Libor at \$160 Trillion, with \$30 Trillion from Exchange Traded Derivatives (ETD). ETD assets backed by USD LIBOR now exceed \$50 Trillion notional, so we estimate total assets backed by USD LIBOR to be roughly \$180 Trillion.

# SOFR – Features and Mechanics

## Secured Overnight Financing Rate (SOFR)

- Endorsed to Federal Reserve by ARRC, June 22 <sup>1</sup>
- Based on overnight repurchase agreement (repo) transactions on US Treasury securities (Treasury repo)

## Publishers

- FRBNY in cooperation with US Office of Financial Research (OFR)

## Publication Schedule

- Daily. SOFR value based on data for a given day is published on the next following US bank business day at 8:30 am New York time <sup>2</sup>
- Regular publication targeted to commence by mid-2018

<sup>1</sup> [“The ARRC Selects a Broad Repo Rate as its Preferred Alternative Reference Rate”](#) – New York Fed Media Library; June 22, 2017

<sup>2</sup> [Federal Reserve Docket OP-1573, “Request for Information Relating to Production of Rates”](#) – Federal Reserve Press Release; August 24, 2017

# SOFR – Features and Mechanics

## Ingredients <sup>1</sup>

- Tri-party Treasury repo trade data collected from Bank of New York Mellon (BNYM)
- Data for Treasury repo trades made through FICC's General Collateral Financing (GCF) repo market, obtained from DTCC Solutions
- Data for bilateral Treasury repo transactions cleared through FICC's Delivery-versus- Payment (DVP) service, obtained from DTCC Solutions. Filtered to remove repo rates corresponding to lowest quartile of bilateral Treasury repo transaction volume

## Calculation

- Transaction-volume-weighted median repo rate

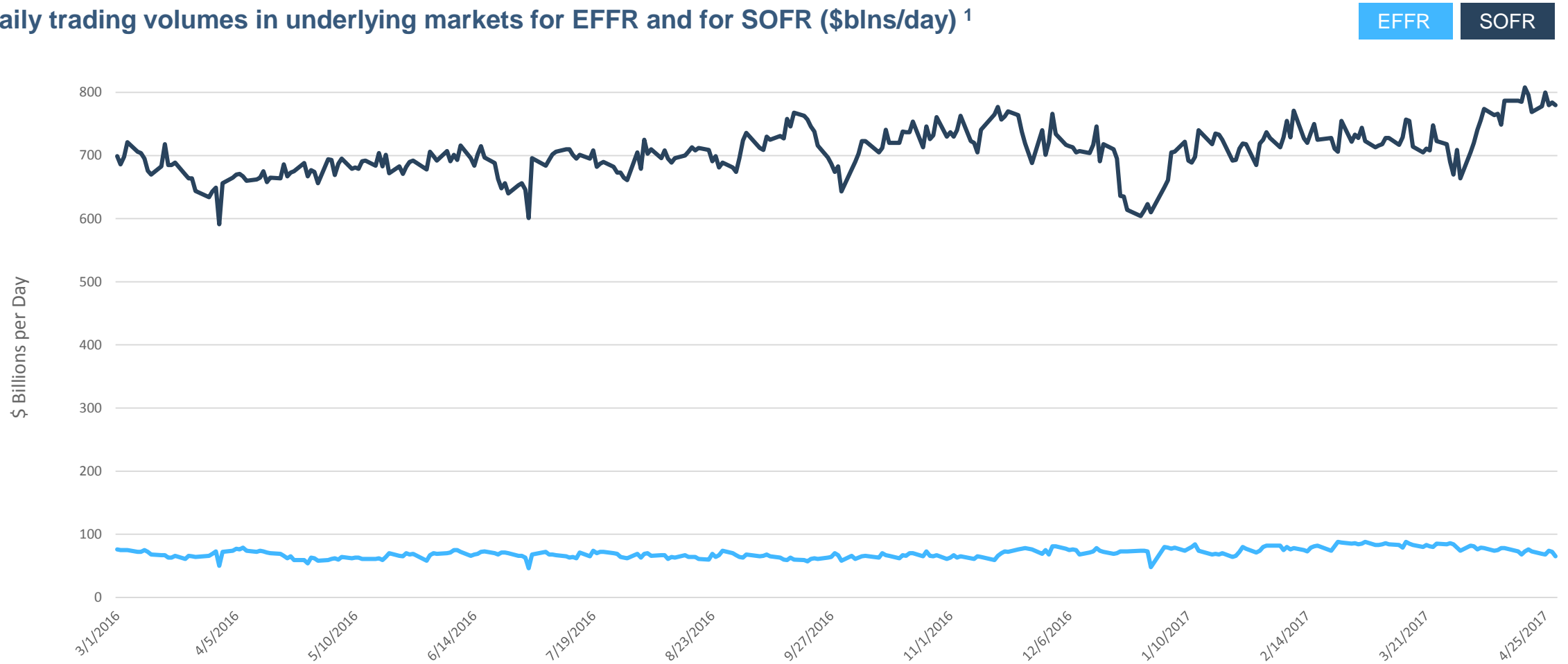
## Benchmark Robustness <sup>2</sup>

- For Sep 2014 – Apr 2017  
volumes in SOFR-eligible Treasury repo transactions = \$660 bln/day,  
ranging between \$520 bln/day and \$810 bln/day

<sup>1,2</sup> [“Introducing the Revised Broad Treasuries Financing Rate”](#) – Liberty Street Economics Blog; June 19, 2017

# SOFR Daily Volumes

Daily trading volumes in underlying markets for EFR and for SOFR (\$blns/day) <sup>1</sup>

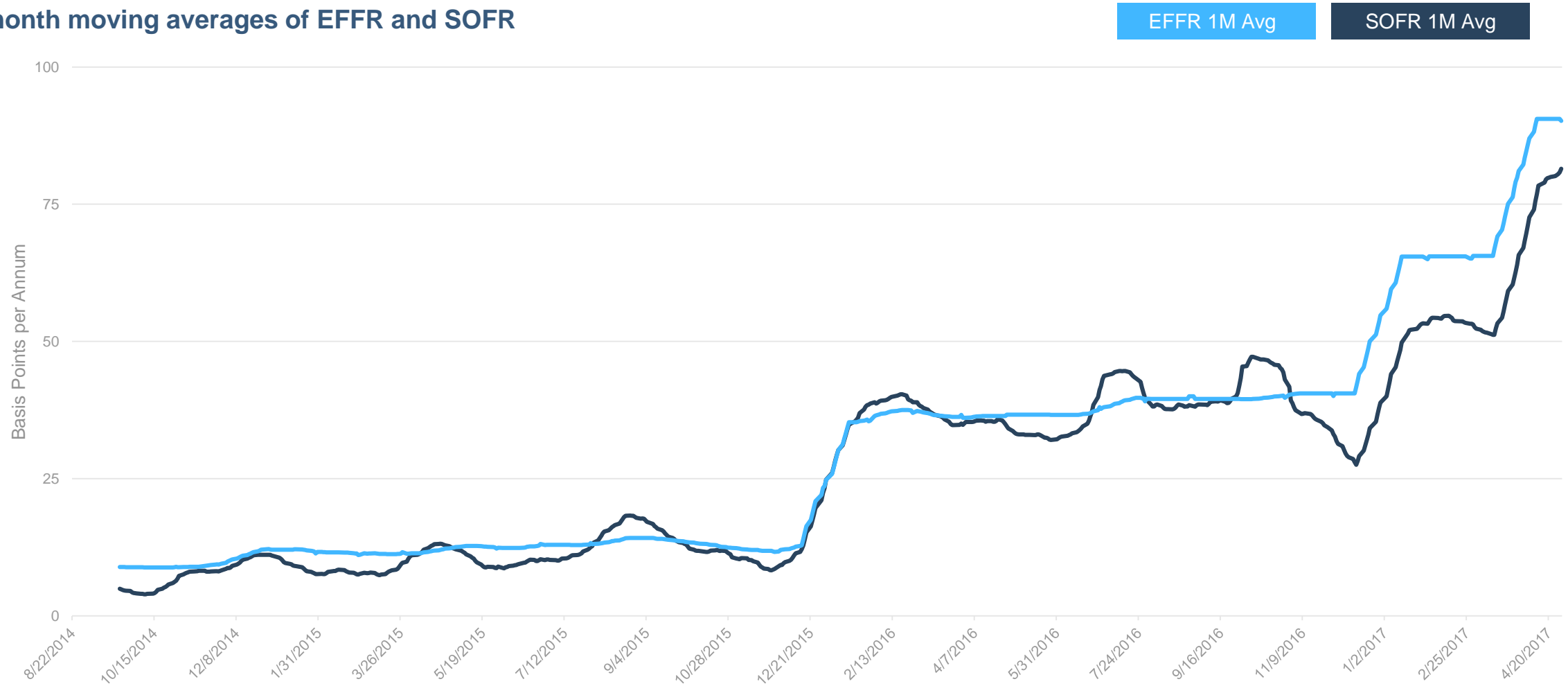


<sup>1</sup> [ARRC Presentation Materials](#) - June 16, 2017



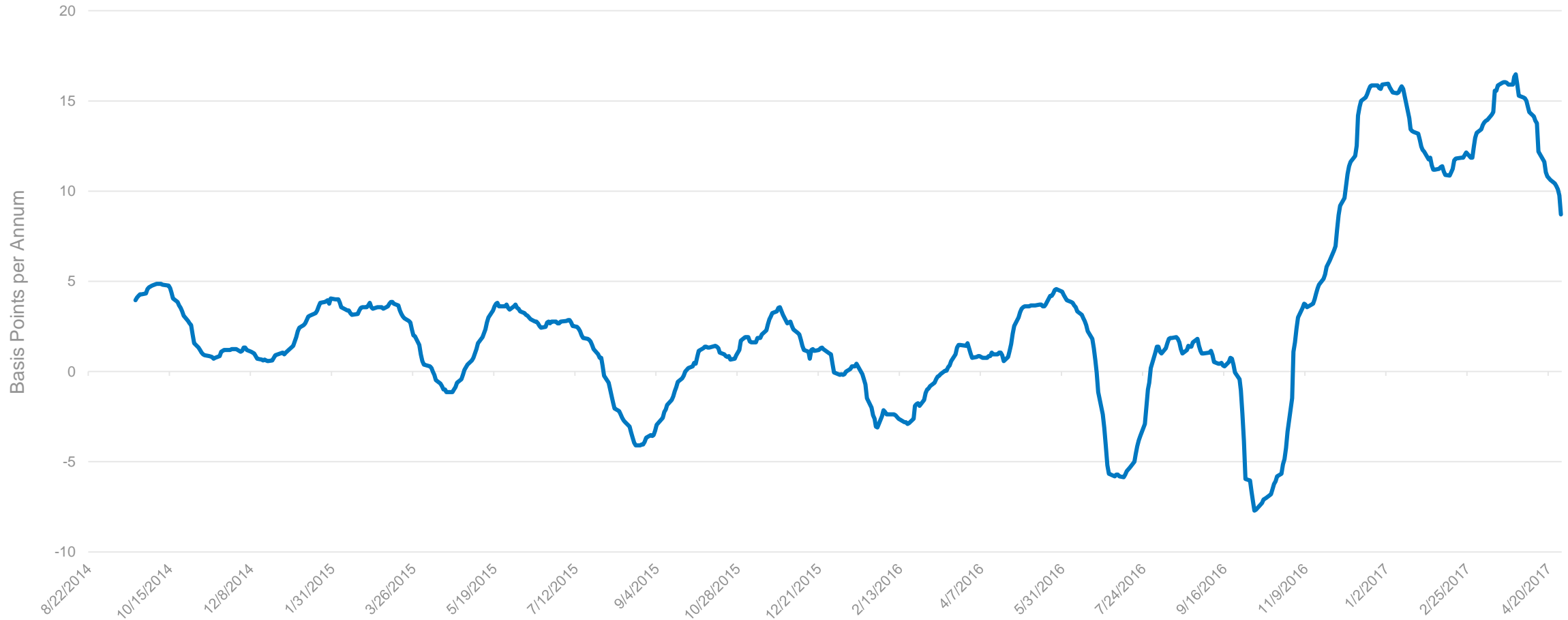
# Comparing SOFR with EFR

1-month moving averages of EFR and SOFR



# Comparing SOFR with EFR

Spread between 1-month moving average EFR minus 1-month moving average SOFR



# **SOFR Futures: Design Considerations and Applications**

# What would make a good SOFR futures contract?

**Building blocks** – Flexibility.

**Familiarity** – Comparability with familiar, established STIR futures products.

**Term exposures** – Reliable indication of market expectations of the future path and future volatility of SOFR.

**Easy spread-trading against established STIR futures** – Clear view on money market spread relationships.

**Margin efficiencies** – Against Eurodollar futures, 30-Day Federal Funds futures, and Treasury Note and Bond futures. Efficient portfolio margining against cleared interest rate swaps.

# Contract Specifications for 30-Day Federal Funds Futures

<b>Contract Grade</b>	Interest on federal funds having principal value of approximately \$5 mln, for one calendar month, at a rate equal to average daily EFFR during contract Delivery Month
<b>Price Basis</b>	<i>IMM Index</i> 100 points minus average daily EFFR during contract Delivery Month
<b>Minimum Price Increment</b>	<i>Nearest Delivery Month</i> ¼ basis point per annum = 0.0025 IMM Index points = \$10.4175 per contract  <i>All other Delivery Months</i> ½ basis point = 0.005 IMM Index points = \$20.835 per contract
<b>Last Trading Day</b>	Last business day of contract Delivery Month. Trading in expiring contracts terminates at 4:00 pm Chicago time
<b>Final Settlement Price</b>	100 points minus average daily EFFR during contract Delivery Month, with average rate rounded to nearest 1/10 basis point  Final settlement price is determined on first FRBNY business day following last trading day
<b>Contact Months</b>	Nearest 36 calendar months

## **Futures Open Interest: 1.6 mln contracts = \$8 trln notional**

- Up 222% compared to 2012-2014 average

## **Futures Average Daily Volume YTD: 209,000 contracts = \$1.05 trln notional**

- Up 690% compared to 2012-2014 average

**Extensive market consultation beginning after this webinar will guide the selection of the above attributes for SOFR futures**

# Contract Specifications for Eurodollar Futures

<b>Contract Grade</b>	Three-month unsecured wholesale Eurodollar bank deposit having principal value of approximately \$1 mln, for spot settlement on 3rd Wednesday of contract Delivery Month
<b>Price Basis</b>	<i>IMM Index</i> 100 points minus the three-month London interbank offered rate for spot settlement on the 3rd Wednesday of contract month. E.g., a price quote of 97.45 signifies a deposit rate of 2.55 percent per annum. One interest rate basis point = 0.01 price points = \$25 per contract
<b>Minimum Price Increment</b>	<i>Nearest Delivery Month</i> ¼ basis point per annum = 0.0025 IMM Index points = \$6.25 per contract  <i>All other Delivery Months</i> ½ basis point = 0.005 IMM Index points = \$12.50 per contract
<b>Last Trading Day</b>	Second London business day before 3rd Wednesday of Delivery Month. Trading in expiring contracts terminates at 4:00 pm Chicago time
<b>Contact Months</b>	Nearest 40 March Quarterly months

**F&O Open Interest: Over 50.5 mln contracts = \$50.5 trln notional**

- Up 78% compared to 2012-2014 average

**F&O Average Daily Volume YTD: 4 mln contracts = \$4 trln notional**

- Up 42% compared to 2012-2014 average

**Extensive market consultation beginning after this webinar will guide the selection of the above attributes for SOFR futures**

# Execution Cost Efficiency through CME Globex

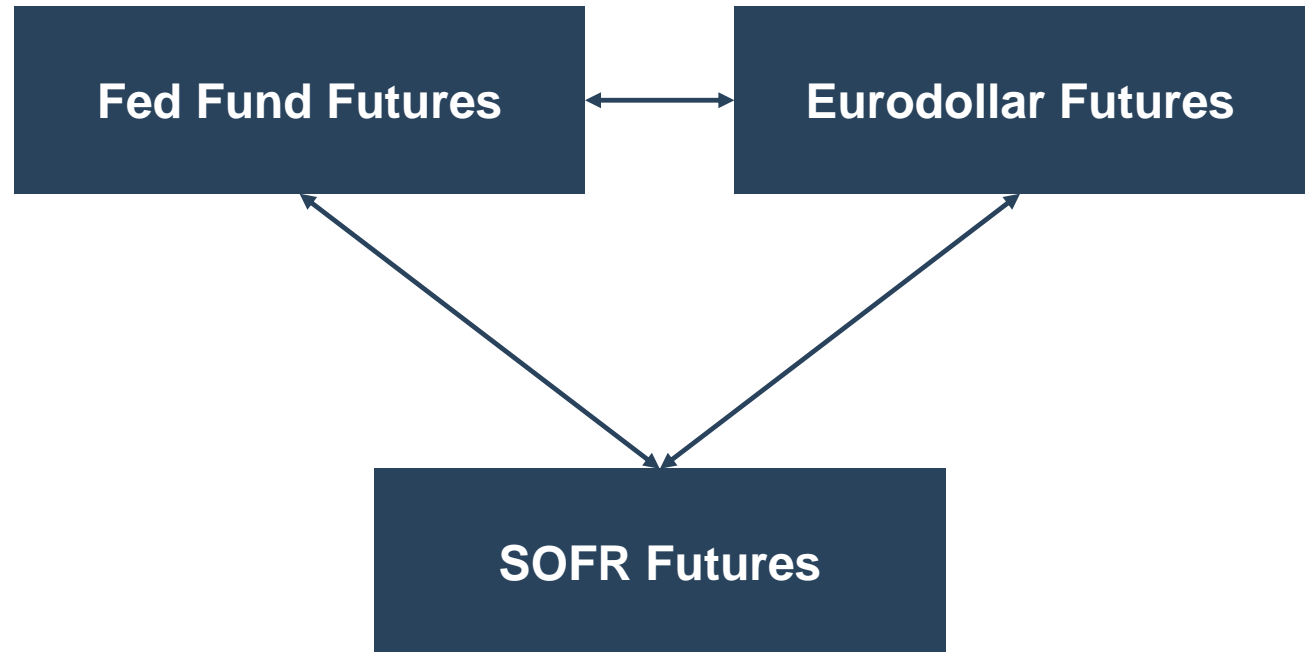
## STIR Inter-Commodity Spreads

### Potential STIR Offering

- CME Eurodollar Futures (3 month)
- CBOT Fed Funds Futures (1 month)
- SOFR Futures (specifications TBD)

### List of Potential Spreading Needs

- Fed Funds Futures vs Eurodollar Futures
- Eurodollar Futures vs SOFR Futures
- Fed Funds Futures vs SOFR Futures



# Fed Funds vs Eurodollar Inter-Commodity Spreads on CME Globex, 2018 Q1 <sup>1</sup>

Facilitates new trading opportunities. Serves as prototype for spreading futures with different tenors

## Spread Design

- Fed Funds vs Eurodollar ICS: 10:6 ratio achieves DV01-neutrality
  - \$250 per basis point on both sides of the spread
- Spread weights =  $10 \times (3+3)$  for ED x (FF1+FF2)
- Legs arranged to match exposures between IMM dates:
  - 1 Eurodollar contract month against the next 2 Fed Funds contract months

## Unique Aspects

- Eurodollar and Fed Fund Futures Inter-Commodity Spreads available for the first time
- Differing dates and notional sizes

Expiration Month	Fed Funds Leg Quantity	Eurodollar Leg Quantity
March		10
April	3	
May	3	
June		
DV01/Contract	\$41.67	\$25.00
Total DV01	\$250.02	\$250.00

<sup>1</sup> Pending Regulatory Approval



# Fed Funds vs Eurodollar ICS on CME Globex, 2018 Q1 <sup>1</sup>

Serves as both a new unique trading opportunity as well as a prototype for spreading instruments of different tenors

## Pricing

- Spread quoted as the yield difference between the Eurodollar futures contract rate and the Fed Funds futures contract rate, closely mirroring OTC market conventions
  - Spread Price = (Average Front Leg Price) – (Average Back Leg Price)
- Closely tracks the P&L of a comparable OTC OIS/FRA spread
- Example trade spread = 22 basis points  
=  $(98.74 + 98.70) / 2$  minus 98.50

### Example Trade Structure - Buy 1 Spread

Product	Action	Qty	Month	Price
Fed Fund	Buy	3	July	98.74
Fed Fund	Buy	3	Aug	98.70
Eurodollar	Sell	10	Jun	98.50

**The above ICS demonstrates Globex's ability to handle futures with different tenors and roll dates, as contract specs for SOFR futures will be decided upon completion of market validation**

<sup>1</sup> Pending Regulatory Approval

# Next Steps

We will reach out to you just as we did in the creation of Ultra 10-Year Treasury Note futures and in managing the five-year issuance gap in the Treasury Bond futures delivery basket

Your input and insights on the design of SOFR futures are very important to us. They will:

- Help achieve a solution that best serves the market's investing, hedging, and risk management needs
- Provide a solid foundation and building block for the derivatives market
- Help determine the appropriate timing for introduction of cleared SOFR-based overnight index swaps (OIS) in alignment with the evolution of the SOFR swap market

Ideally, the solution will make adoption of SOFR as straightforward and efficient as possible, by facilitating:

- **Price discovery**, including determination of essential term SOFR rates
- **Capital efficiencies** through portfolio margining between Eurodollar, Fed Funds, and SOFR Futures, and Cleared OTC Swaps
- **Execution efficiencies** through inter-commodity spreads on CME Globex
- **Efficient risk management** of cleared SOFR-based OIS

## Next Steps

We are eager to hear your comments and questions:

**Potential drawbacks?**

**Alternative structures?**

If you wish to speak with us about SOFR derivatives, please contact us at [InterestRate@cmegroup.com](mailto:InterestRate@cmegroup.com)

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