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December 17, 2021

**Via Electronic Mail**

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**Re: FHFA Supervisory Letter - Alternative Reference Rate Selection Risk Management**

Dear Mr. Galeano,

I am writing to you on behalf of SOFR Academy Inc., a U.S. based digital education and data provider<sup>1</sup> headquartered in New York. Our panel of advisors includes academics from Harvard University, the University of California Berkeley, New York University and Tsinghua University as well as experienced financial services professionals<sup>2</sup>. We provide education and data to corporations, financial institutions, governments, regulators, and individuals on important topics relating to financial markets, such as the transition from LIBOR to more robust reference rates like SOFR. The firm is backed by venture capital.

SOFR Academy supports SOFR. In the longer run, we also support robustly defined dynamic credit spread add-ons to SOFR, such as the Across-the-Curve Spread Indices (AXI), whose operationalization SOFR Academy is driving. Unlike other credit spread add-on proposals which

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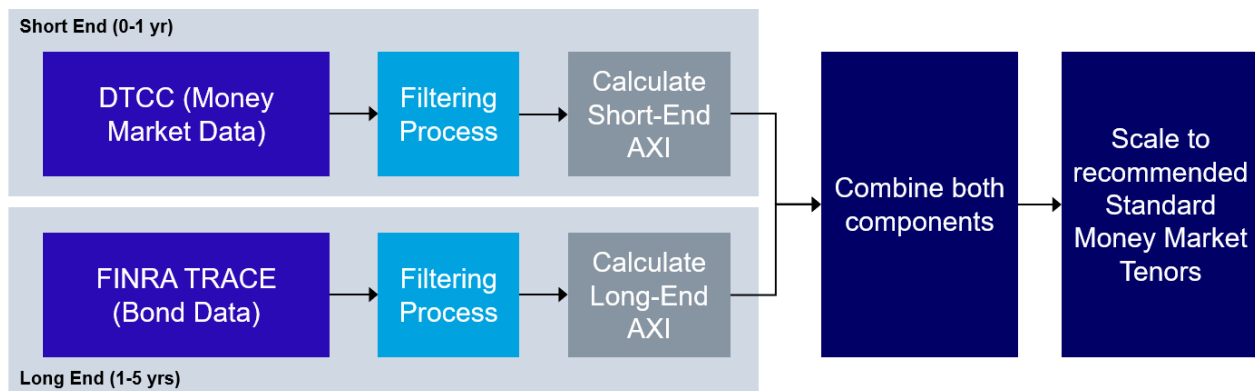
<sup>1</sup> SOFR Academy is a member of the Loan Syndications and Trading Association (LSTA), the International Swaps and Derivatives Association (ISDA), the Asia Pacific Loan Market Association (APLMA) and the Bankers Association for Finance and Trade (BAFT) which is a wholly owned subsidiary of the American Bankers Association (ABA).

<sup>2</sup> <https://sofracademy.com/our-people/>

generally correlate highly with LIBOR, AXI is a weighted average of the credit spreads of unsecured bank funding transactions with maturities out to five years, with weights that reflect both transaction volumes and issuance volumes. As such, it is more representative of true bank funding costs. AXI is added to SOFR and is not a standalone rate. The Financial Conditions Credit Spread Index (FXI) is an extension of AXI that incorporates data based on transactions of both financial and non-financial corporate debt instruments and is approximately 500% more robust.

AXI is calculated as one number that can then be scaled down<sup>3</sup> to standard money market tenors, for example, 1-month, 3-months, 6-months etc. AXI can be added to SOFR, CME Term SOFR, simple daily SOFR, SOFR compounded in arrears, or other SOFR variants, to form a credit-sensitive interest rate benchmark. AXI was one of the proposals discussed at the Federal Reserve Bank of New York’s Credit Sensitivity Group (CSG) Workshops<sup>4</sup> and the Forum on ongoing innovation in reference rates for commercial lending. The original intention of the CSG workshops was to explore a credit sensitive add-on to SOFR. The following diagram provides a visual representation of AXI’s construction flow.

Exhibit 1: AXI construction summary



AXI was conceived in an academic paper<sup>5</sup> by Professor Antje Berndt, Professor Darrell Duffie<sup>6</sup>, and Dr. Yichao Zhu to assist with US-dollar LIBOR transition. Berndt is a Professor of Finance at the College of Business and Economics, Australian National University. Duffie is the Adams Distinguished Professor of Management and a Professor of Finance at the Graduate School of Business, Stanford University, and a research fellow of the National Bureau of Economic Research. Zhu is a Senior Lecturer in finance at the College of Business and Economics,

<sup>3</sup> Notification of Technical Enhancement to AXI Scaling Methodology <https://sofracademy.com/wp-content/uploads/2021/12/AXI-Technical-Note-Enhancement-to-Scaling-Methodology.pdf>

<sup>4</sup> Transition from LIBOR: Credit Sensitivity Group Workshops <https://www.newyorkfed.org/newsevents/events/markets/2020/0225-2020>

<sup>5</sup> Berndt, A., D. Duffie, and Y. Zhu (2020), Across-the-Curve Credit Spread. Stanford University Graduate School of Business Research Paper No. 3884, Available at SRN: <https://ssrn.com/abstract=3662770>

<sup>6</sup> Professor Duffie is not involved with SOFR Academy Inc. nor the operationalization of AXI.

Australian National University. Professor Duffie chaired a Market Participants Group on Reforming Interest Rate Benchmarks (or the Market Participants Group on Reference Rate Reform). The group was established by the Financial Stability Board ([Market Participants Group \(2014\)](#)).

SOFR Academy joins with the Alternative Reference Rates Committee<sup>7</sup> (ARRC) in welcoming and supporting the Federal Housing Finance Agency’s (FHFA) supervisory letter<sup>8</sup> dated July 1, 2021, regarding alternative reference rate selection risk management and we are pleased to share draft guidance on how the framework sketched out in your letter would apply to AXI when added to SOFR. SOFR + AXI is referred to as ‘SOFRx’ in loan and derivatives documentation.

FHFA Consideration	FHFA Explanation	Applicability to SOFR + AXI
Volume of Underlying Transactions	Is the reference rate based on actual market transactions every day, including during times of economic stress?	<ul style="list-style-type: none"> <li>▪ AXI is based on actual market transactions, always.</li> <li>▪ AXI is not limited to short term transactions and takes into account the deeper and longer pool of bank funding transactions that occur further out the yield curve.</li> <li>▪ AXI always reflects competitive forces of supply and demand and is anchored by a sufficient number of observable arm’s-length transactions, during all market conditions including periods of stress.</li> </ul>
Credit Sensitive	Does the alternative reference rate have sufficient correlation with Bank funding costs?	<ul style="list-style-type: none"> <li>▪ By design, AXI is highly correlated with U.S. bank funding costs. The academic architects of AXI intentionally stayed away from LIBOR.</li> <li>▪ AXI is not highly correlated with LIBOR which is a differentiating feature of the index among all other proposed credit sensitive indexes. After all, “over time, LIBOR became more of an arbitrary and sometimes self-interested announcement of what banks simply wished to charge for funds” (<a href="#">Quarles, 2021</a>).</li> </ul>

<sup>7</sup> <https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/20210701-arrc-press-release-fhfa-supervisory-letter>

<sup>8</sup> <https://www.fhfa.gov/SupervisionRegulation/LIBORTransition/Documents/Alternative-Reference-Rate-Selection-Risk-Management-712021.pdf>

<p>Model Risk</p>	<p>Is the reference rate the most robust version available for the purpose intended?</p>	<ul style="list-style-type: none"> <li>▪ AXI does not rely on executable quotes or indications as input data</li> <li>▪ SOFR Academy has previously committed in a letter<sup>9</sup> to the ARRC that AXI would be made available in a manner consistent with ARRC principles to the extent practicable.</li> <li>▪ The design of AXI is consistent with the spirit in which the Principles for Financial Benchmarks<sup>10</sup> were developed by the International Organization of Securities Commissions (IOSCO). Adopting an across-the-curve construction methodology ensures that the maximum number of transactions are captured and that index alignment with the IOSCO Principles is sustained over time.</li> </ul>
<p>Underlying Transactions</p>	<p>Does the FHLBank have the necessary information about the underlying transactions and methodology supporting a candidate reference rate to monitor its representativeness over time?</p>	<ul style="list-style-type: none"> <li>▪ AXI was conceived in an academic paper which is publicly available: Berndt, Antje and Duffie, James Darrell and Zhu, Yichao, Across-the-Curve Credit Spread Indices (July 23, 2020). Stanford University Graduate School of Business Research Paper No. 3884, Available at SSRN: <a href="https://ssrn.com/abstract=3662770">https://ssrn.com/abstract=3662770</a> and was discussed at the FRBNY’s CSG.</li> <li>▪ Input data for AXI comes from publicly available sources only. AXI’s long end input data is obtained from Financial Industry Regulatory Authority’s (FINRA) Trade Reporting and Compliance Engine (TRACE). FINRA is regulated by the Securities and Exchange Commission (SEC). AXI’s short end input data is obtained from the Depository Trust &amp;</li> </ul>

<sup>9</sup> Progress update for the Alternative Reference Rates Committee (ARRC) regarding the Across-the-Curve Credit Spread Index (AXI) <https://sofracademy.com/wp-content/uploads/2021/06/SOFR-Academy-Letter-To-The-ARRC-Providing-An-Update-On-AXI-FXI-FINAL.pdf>

<sup>10</sup> <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf>

		<p>Clearing Corporation (DTCC).</p> <ul style="list-style-type: none"> <li>▪ No proprietary data is used in the construction methodology maximizing the transparency of the index.</li> <li>▪ AXI automatically adapts to future changes in funding composition, ensuring its representativeness and robustness are maintained over time.</li> <li>▪ Detailed documentation on AXI's construction methodology along with educational materials, a 60-second explainer <a href="#">video</a>, and AXI Prototype Spreads (updated each business day at approximately 8am EST) are available on the AXI <a href="#">website</a>.</li> <li>▪ We are also developing a self-paced <a href="#">eLearning course</a> 'Understanding and Applying Across-the Curve Credit Spread Indices (AXI)'. We intend to release the course in January 2022 and to make it available to market participants at zero cost.</li> </ul>
<p>Contractual Fallback Language</p>	<p>Is there sufficient clarity in the contractual language accompanying the use of the rate to determine (a) when the rate will be considered unreliable or unrepresentative, (b) what replacement rate will be used, and (c) what entity will make those decisions?</p>	<ul style="list-style-type: none"> <li>▪ AXI is a simple and robustly defined forward-looking term credit spread add-on to SOFR. In general, AXI conventions for use in loans will seek alignment with existing industry standards.</li> <li>▪ The AXI spread is known in advance of the interest period, much like it is for LIBOR-based loans today, and thus most of the loan conventions can be similar to LIBOR and CME Term SOFR loan conventions.</li> <li>▪ Daycount recommendation is Actual/360 days for AXI, which is the standard convention in U.S. money markets; however it is possible to use other daycounts such as Actual/365 days.</li> </ul>

		<ul style="list-style-type: none"> <li>▪ With permission from the LSTA, legal counsel produced a Draft <a href="#">Term SOFR + AXI Concept document</a> which clearly sets out detailed contract language accompanying the use of AXI including best practice fallback language. The document provides an illustrative example of a credit agreement that references CME Term SOFR + AXI for a syndicated term loan facility denominated in US-Dollars. We remain open to refining contractual language based on guidance from associations such as the LSTA and ISDA as well as regulatory communications.</li> </ul>
<p>Depth of Derivative Markets</p>	<p>Does the FHLBank have the ability to obtain adequate hedging for the rate chosen in the foreseeable future and under stressful market conditions?</p>	<ul style="list-style-type: none"> <li>▪ We have received interest in AXI from a wide range of financial institutions including from primary dealers and Global Systemically Important Banks (GSIB) who are major market makers of fixed income derivative products.</li> <li>▪ ISDA have indicated that they expect to draft new Rate Options for SOFRx which would help to facilitate the development of a hedging market. Each variation of SOFR will require a separate Rate Option and we hope to begin with Term SOFRx.</li> <li>▪ We have been contacted by major market data providers who have requested to stream AXI prices across their platforms, so we expect AXI spreads to be widely available and accessible.</li> </ul>

We recognize that not all market participants desire credit sensitivity in their lending reference rates, but for the segment of the market that does, we believe SOFR + AXI represents a responsible and sustainable solution. Importantly, when a loan is indexed to AXI it will also reference SOFR, so AXI’s launch promotes the adoption of SOFR.

SOFR Academy is committed to operationalizing AXI in a considered and measured way that incorporates feedback and guidance from a wide range of stakeholders and prioritizes the financial stability of the system. We have met with the Office of the Comptroller of the Currency

(OCC), and we intend to publish guidance for AXI pertaining to the OCC's LIBOR Transition Self-Assessment Tool for Banks shortly. Additional information on AXI is available at our website (<https://sofracademy.com/axi/>).

We commend the FHFA's leadership in the transition to SOFR and we appreciated your taking time to discuss AXI. We will keep you updated on key developments and are happy to answer any follow up questions you may have.

Sincerely,



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