Financial Stability Considerations in connection with the Invesco / SOFR Academy USD Across-the-Curve Credit Spread Indexes (AXI) and Invesco / SOFR Academy USD Financial Conditions Credit Spread Indexes (FXI).

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SOFR Academy and Invesco Indexing LLC support the Secured Overnight Financing Rate (SOFR). Over time, we also support the introduction of Across-the-Curve Credit Spread Indices such as AXI and FXI as robustly designed credit spread supplements to SOFR. SOFR, AXI and FXI are well-designed benchmarks and grounded in market transactions.

#	Potential financial stability considerations in connection with credit-sensitive rates	USD-AXI	USD-FXI
1	Measure a small fraction of banks' actual funding costs, as issuance of Commercial Paper (CP) and Certificates of Deposit (CD) represent only a small proportion of banks' funding	Large banks no longer fund themselves at LIBOR in the same way that they used to, and there are not enough transactions with which to calculate LIBOR. Regulations have induced banks to "term out" most of their unsecured funding to longer maturities (Committee on the Global Financial System (2018)). AXI and FXI are not limited to short term funding markets such as Commercial Paper (CP) and Certificates of Deposit (CD). Rather, AXI and FXI depend on a broad set of debt issuances with maturities ranging from short term to multiple years.	
2	Typically have very low average transaction volumes, and almost none in periods of market stress. As seen during the 'dash for cash' in March 2020, transactions in underlying CP and CD markets fell away, and the liquidity premium for cash placed upward pressure on rates. In comparison, the volume of transactions underpinning SONIA and SOFR rose over the same period	Utilizing transactions from across-the-curve maximizes the underlying transaction volume that are used to calculate the benchmarks. Transaction volume increased during the most recent market stress period. In mid-March 2023, underlying transaction volumes for the longer-term bond component of AXI increase by approximately 500%.	FXI follows the same methodology as AXI, but the underlying transactions are expanded beyond banks to include all financial institutions as well as corporate funding transactions.

3	Are highly sensitive to liquidity conditions, introducing large risk premia during stressed periods, which do not reflect wider funding conditions and could disproportionately affect borrowers.	Recent research shows that in a SOFR only regime, borrowers might be adversely affected during stress periods (Cooperman, Duffie, Luck, Wang, and Yang (2023)). AXI and FXI can counteract the adverse impact on bank lending in distress times (Ghamami, 2023). AXI is, by definition, highly correlated with banks' contemporaneous marginal costs of funds.	FXI is, by definition, a direct reflection of wider funding conditions across the United States. Movement of FXI relative to AXI in times of market stress will likely depend on the nature of the stress event. For example, during a broad-based stress event such as COVID, FXI moved higher than AXI. For a stress event centered on the banking sector, such as the March 2023 banking turmoil, AXI will likely move higher than FXI.
4	Rely on models, quoted rates and other techniques, such as expanding the window of "daily volumes," to compensate for low underlying volumes.	Neither AXI nor FXI rely on models or quoted rates. Input data for AXI and FXI is obtained only from publicly available sources. The long-end component data comes from Financial Industry Regulatory Authority (FINRA) Trade Reporting and Compliance Engine (TRACE). The short-end component is obtained from Depository Trust & Clearing Corporation (DTCC) Money Market Kinetics. This provides a single, daily feed of anonymized CP and CD secondary settlement transactions data. No proprietary data is used in the construction of AXI or FXI. A one-month observation period was selected for implementation of AXI and FXI. Reliance on a smaller observation period would produce a more volatile index with greater susceptibility to manipulation. Moreover, at any point in time, a bank's recent cost of funds is determined by the yields of its recently issued stack of liabilities, most of which are issued on a range of past dates (Berndt, Duffie, Zhu, 2020).	
5	Are vulnerable to potential structural market shifts, such as from potential future money market fund reforms	AXI and FXI automatically adapt to changes in funding composition for banks (AXI) and the broader United States economy (FXI). The benchmarks were designed to maintain their hedge effectiveness and robustness over time and can be reliably computed in all economic	

		conditions, including in times of market stress. If for example, money market fund reforms or Basel III implementation resulted in banks shifting the maturity of volume weighted funding, AXI and FXI would automatically weight that part of the yield curve.

USD-AXI and USD-FXI are available only as credit spread supplements to SOFR, and therefore leverage the robust foundation of SOFR. Whenever a loan is indexed to an across-the curve credit spread index, it would also reference SOFR. So, use of a credit spread index does not imply less frequent reference to SOFR.

For questions, comments or to request additional information please complete the contact for at:

https://www.invescosofracademyaxi.com/

For information about Invesco Indexing's governance of benchmarks please visit:

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Darrell Duffie, who is the Adams Distinguished Professor of Management and Professor of Finance at the Stanford Graduate School of Business and a co-author of the proposal for AXI, has no related compensation and is not affiliated with SOFR Academy.

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Upon each update to this methodology, the most recent version shall be deemed to supersede the preceding version from the date of such update such that, in the event of any conflict between an earlier version of the methodology and the most recent version, the most recent version shall prevail.

SONIA = Sterling Overnight Index Average

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