

2023 Fixed Income Index Products Annual Report Credit Overview – Spreads, Volatility and Volumes

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Introduction

The year 2023 was marked by significant events that affected global financial markets, including a bear market for most of the year, geopolitical conflicts, the U.S. regional banking crisis and the UBS acquisition of Credit Suisse. These events contributed to heightened market volatility and shifts in trading volumes across various financial instruments. This report aims to highlight the tradeable volumes in index products linked to key S&P DJI credit indices, with a focus on exchange-traded funds (ETFs), credit default swap (CDS) Indices, standardized total return swaps (TRS) and futures. Finally, we close with an analysis of the bid-ask spreads across these products and on the individual bonds that comprise key iBoxx indices.

Credit Spreads and Volatility

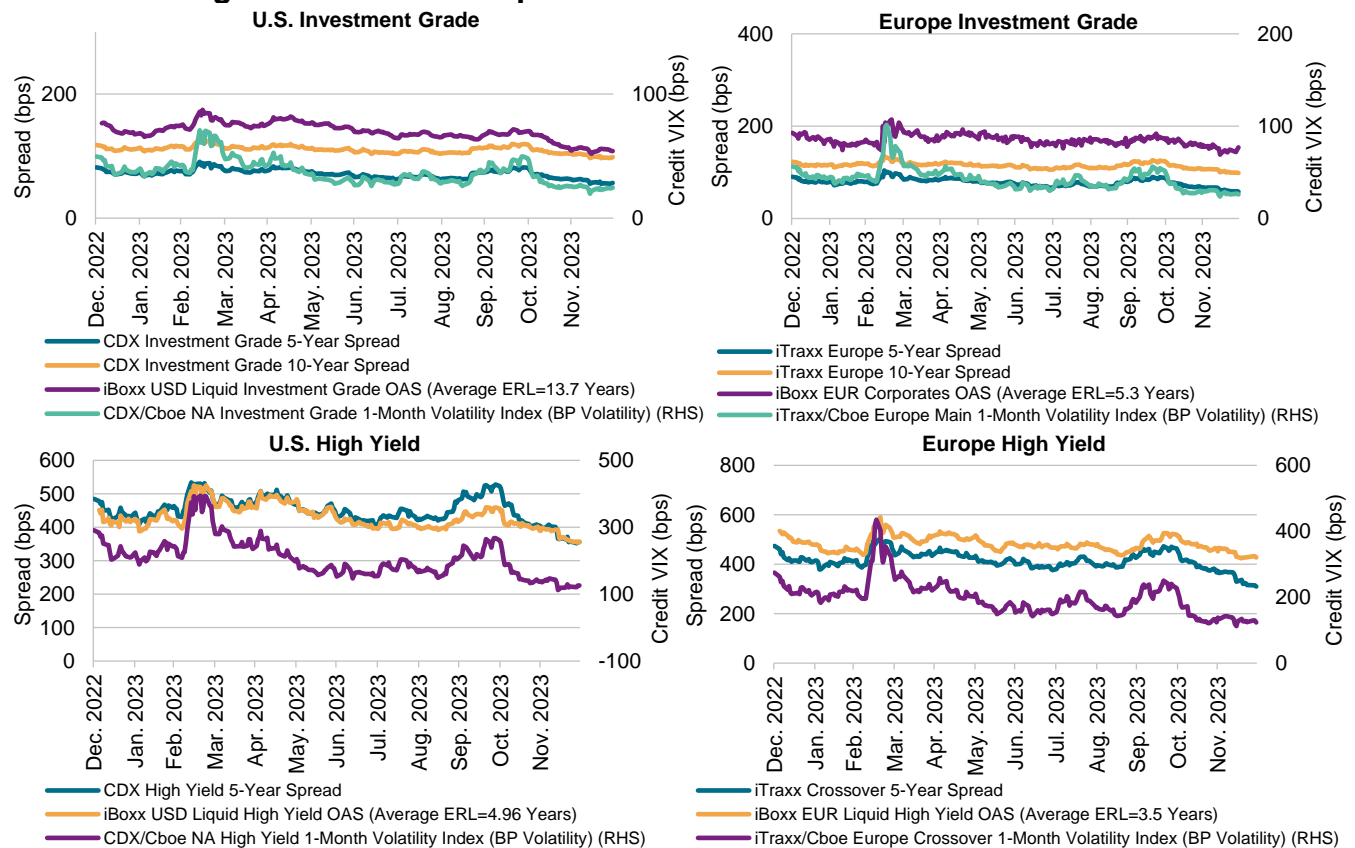
After consistent interest rate hikes in 2022 across the U.S. and European markets, 2023 started off with expectations of interest rates peaking during the year. These expectations manifested in credit spreads tightening in the first two months of 2023, as well as a decrease in the market's expectations of future credit volatility as indicated by the Credit VIX[®] indices. However, these expectations were relatively short lived, with credit spreads spiking in March 2023 due to stress in the U.S. regional banking sector and concerns related to the potential default of Credit Suisse prior to its acquisition by UBS.

As wider repercussions of the banking sector events were avoided, credit spreads recovered and set off on a consistent path of tightening over the following few months. Since April 2023, the market’s expectations of credit volatility across the North American and European investment grade and high yield credit markets have been on a downward trend, barring a brief period in October, which saw a rise in credit spreads and expected credit volatility.

Overall, spreads across all major credit markets ended the year tighter than when had started, driven by the U.S. Federal Reserve Bank and the European Central Bank halting interest rate hikes in the second half of 2023 and the market pricing in potential interest rate cuts in 2024.

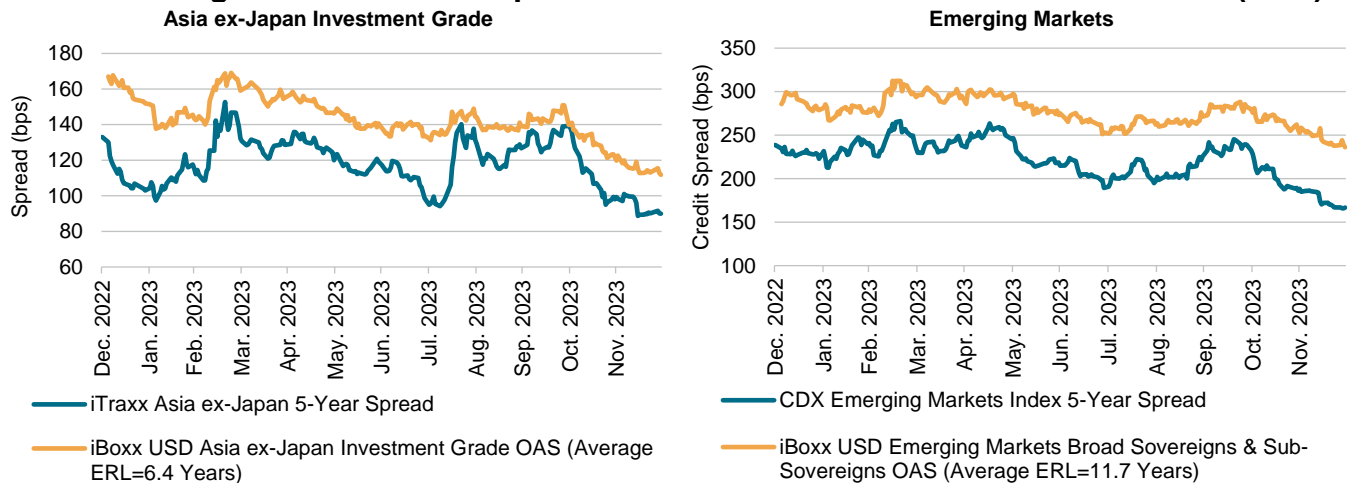
The charts in Exhibit 1 illustrate the progression of credit spreads over the course of 2023 across global credit markets, as indicated by the relevant iTraxx/CDX index spreads and the iBoxx bond index option-adjusted spreads. For the U.S. and European markets, the relevant Credit VIX indices indicate the market’s expectations of credit volatility over the following one-month period.

Exhibit 1: Progression of Credit Spreads over 2023 across Global Credit Markets



Source: S&P Dow Jones Indices LLC, [Credit VIX - Indices | S&P Dow Jones Indices \(spglobal.com\)](#), [iBoxx Indices Web \(ihsmarkit.com\)](#), [S&P Global Market Intelligence](#). Data from Dec. 30, 2022, to Dec. 31, 2023. OAS stands for option-adjusted spread. ERL stands for expected remaining life. The CDX/Cboe NA Investment Grade 1-Month Volatility Index (BP Volatility), iTraxx/Cboe Europe Main 1-Month Volatility Index (BP Volatility), CDX/Cboe NA High Yield 1-Month Volatility Index (BP Volatility) and iTraxx/Cboe Europe Crossover 1-Month Volatility Index (BP Volatility) were launched Oct. 13, 2023. All data prior to index launch date is back-tested hypothetical data. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Exhibit 1: Progression of Credit Spreads over 2023 across Global Credit Markets (cont)



Source: S&P Dow Jones Indices LLC. [Credit VIX - Indices | S&P Dow Jones Indices \(spglobal.com\)](#), [iBoxx Indices Web \(ihsmarkit.com\)](#). Data from Dec. 30, 2022, to Dec. 31, 2023. OAS stands for option-adjusted spread. ERL stands for expected remaining life. The CDX/Cboe NA Investment Grade 1-Month Volatility Index (BP Volatility), iTraxx/Cboe Europe Main 1-Month Volatility Index (BP Volatility), CDX/Cboe NA High Yield 1-Month Volatility Index (BP Volatility) and iTraxx/Cboe Europe Crossover 1-Month Volatility Index (BP Volatility) were launched Oct. 13, 2023. All data prior to index launch date is back-tested hypothetical data. Past performance is no guarantee of future results. Charts are provided for illustrative purposes and reflect hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

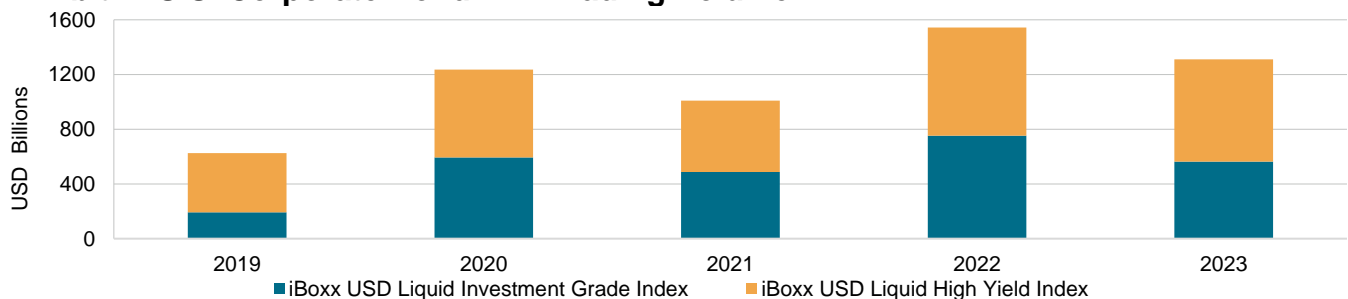
Trading Volumes of Key Credit Index Products

ETFs

Fixed income ETFs have continued to gain popularity as versatile investment vehicles due to benefits that include liquidity, diversification and tax efficiency. In 2023, ETFs linked to key iBoxx USD and EUR corporate bond indices saw significant trading activity.

ETF trading volumes linked to the iBoxx USD Liquid High Yield Index and iBoxx USD Liquid Investment Grade Index in 2023 were USD 748 billion and USD 563 billion, respectively. The aggregate USD 1,311 billion in traded volumes in 2023 was down approximately 15% versus USD 1,543 billion in 2022. However, 2022's record volumes were driven by exceptional fixed income volatility, with 2023 still representing the second-highest year in terms of trading volumes over the past five years.

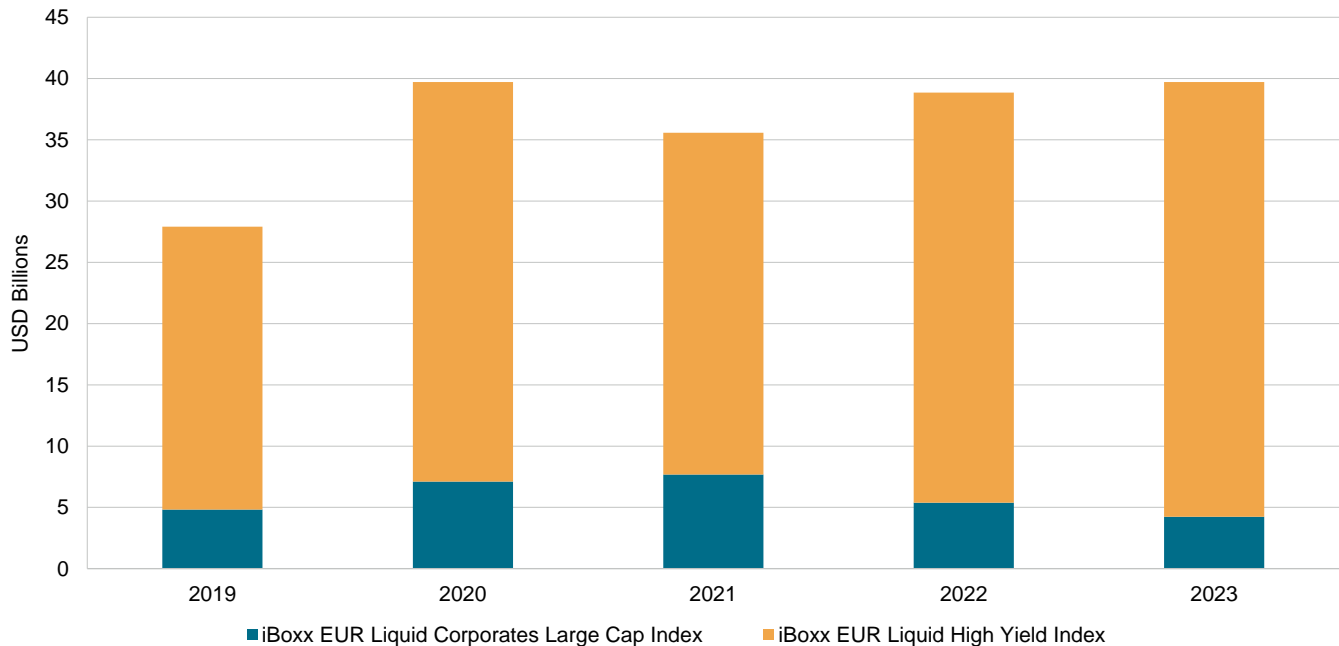
Exhibit 2: U.S. Corporate Bond ETF Trading Volume



Source: BlackRock, Bloomberg. Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

In 2023, ETF trading volumes linked to the iBoxx EUR Liquid High Yield Index and iBoxx EUR Liquid Corporates Large Cap Index were USD 35.5 billion and USD 4.2 billion, respectively. The high yield index notched record volumes (up 6%) for the second year in a row, while the large cap index saw year-over-year volumes decrease by 21.5%.

Exhibit 3: Europe Corporate Bond ETF Trading Volume

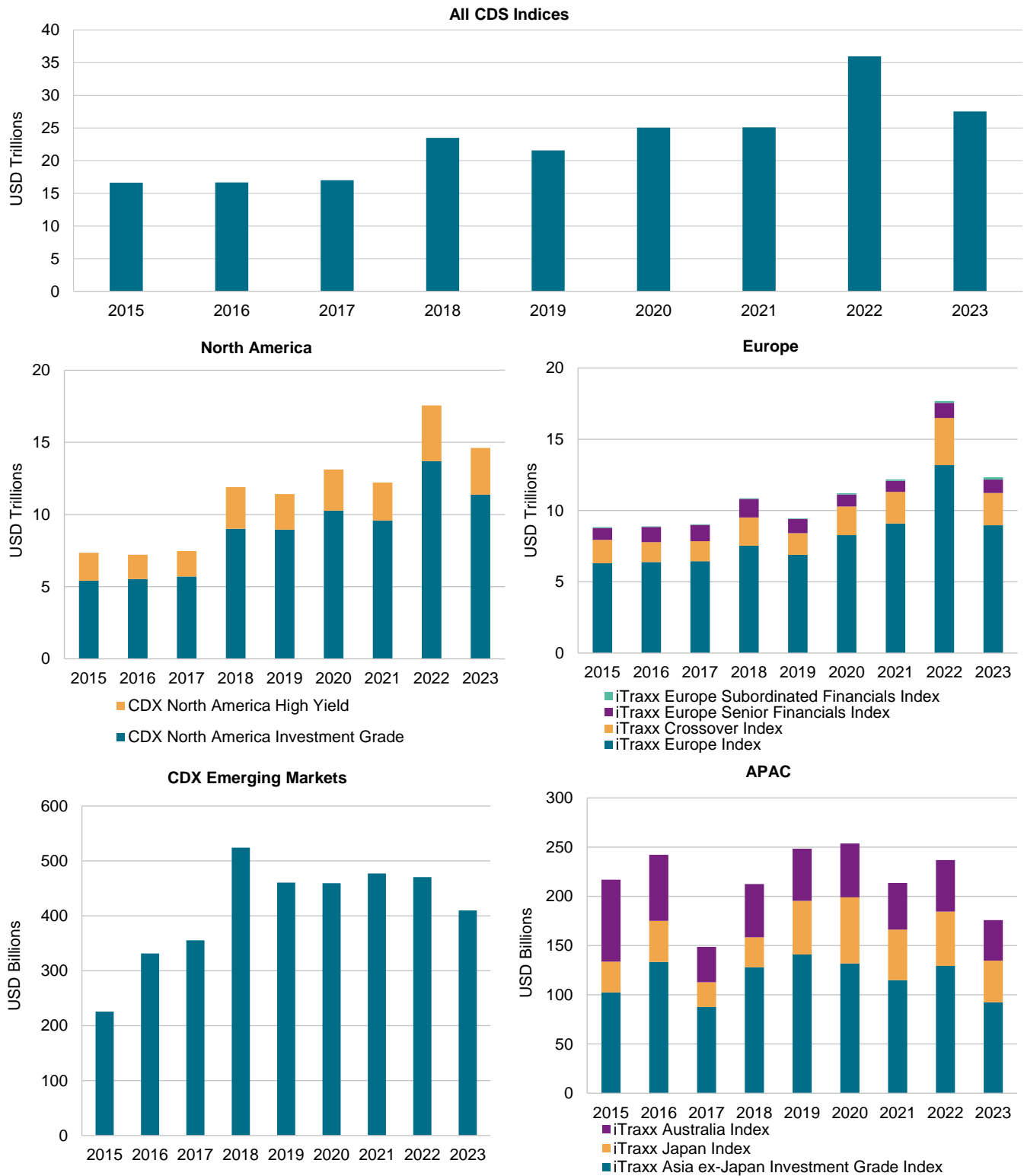


Source: BlackRock, Bloomberg. Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

CDS Indices

After a record year of iTraxx/CDX index trading volumes in 2022, iTraxx/CDX indices posted another strong year, with an estimated USD 27.5 trillion notional traded in 2023. While 2023 volumes were lower by about 23% relative to 2022, they were still up 10% relative to the 2021 volumes, indicating a consistent upward trajectory since 2015. iTraxx/CDX indices are among the most liquid credit derivatives in the market and they continue to play a major role in the credit liquidity ecosystem. Exhibit 4 provides a regional breakdown of iTraxx/CDX index trading volumes.

Exhibit 4: iTraxx/CDX Indices Notional Traded

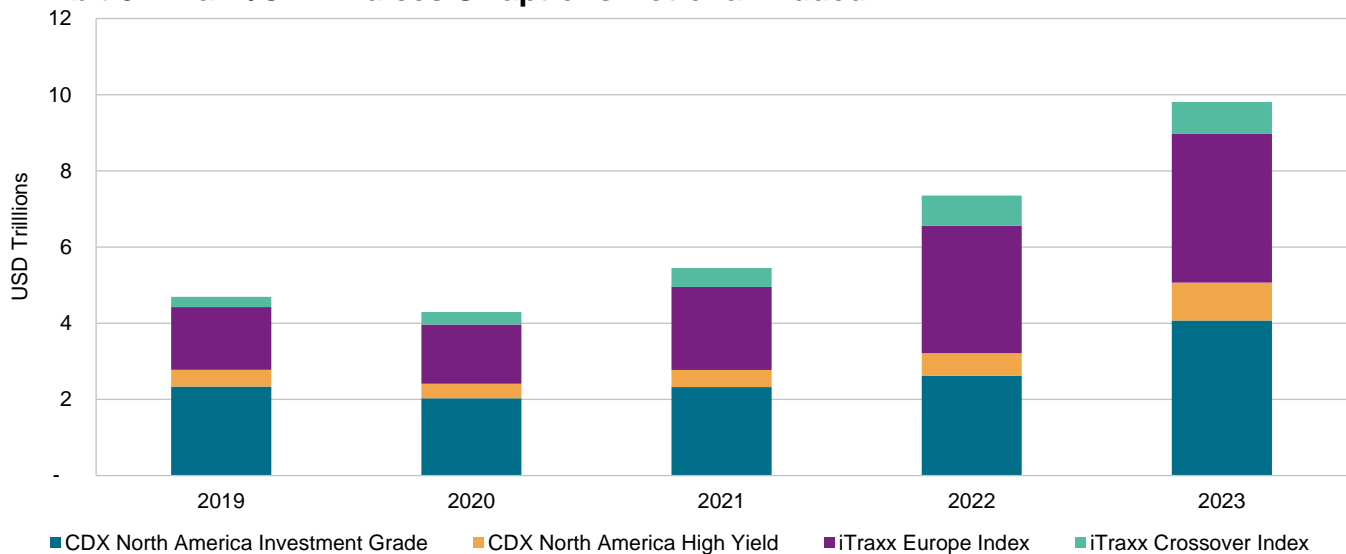


Source: Depository Trust & Clearing Corporation, [CDS Kinetics Service | DTCC Liquidity & Benchmark Analytics Consulting](#). Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

CDS Index Options

iTraxx/CDX swaptions posted record volumes in 2023, trading just shy of an estimated USD 10 trillion in notional, up 33% relative to 2022. iTraxx/CDX swaptions have historically proven to be highly liquid instruments that may be used to gain exposure to or hedge credit volatility. With the October 2023 launch of the Credit VIX Indices, which reference these iTraxx/CDX swaptions, the market gained a robust measure for tracking expected volatility in credit markets.

Exhibit 5: iTraxx/CDX Indices Swaptions Notional Traded

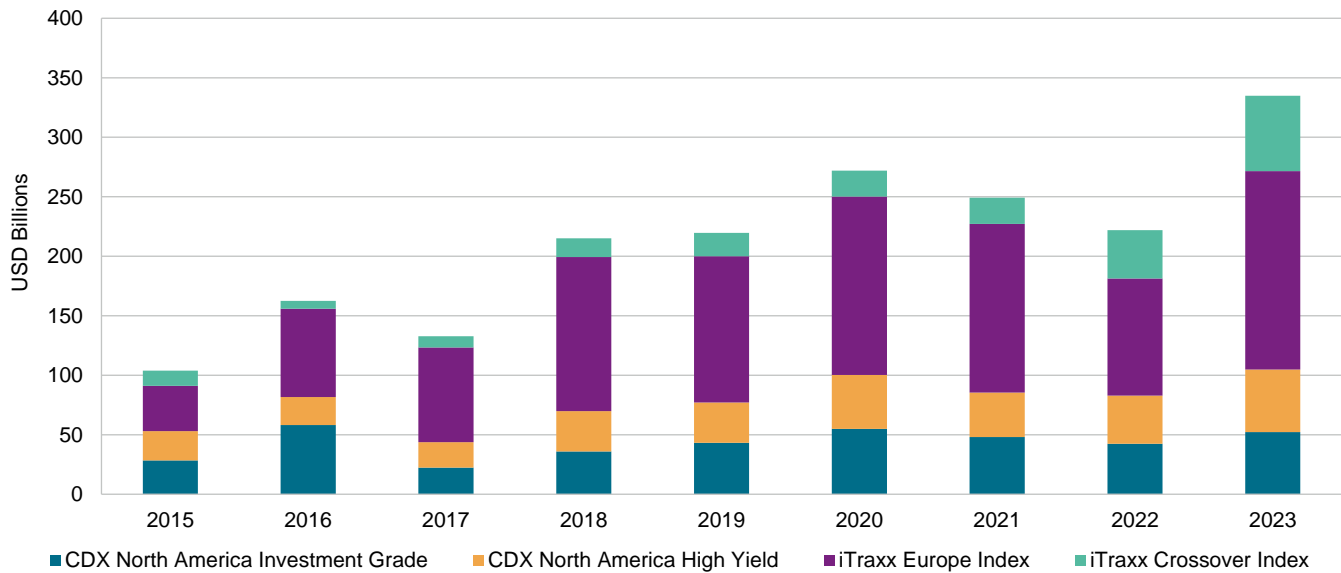


Source: OSTTRA. www.osttra.com. Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

CDS Index Tranches

Like iTraxx/CDX swaptions, 2023 proved to be a record year for iTraxx/CDX tranches with an estimated USD 335 billion notional traded, up 51% from 2022. The annual percentage increases in 2023 were higher for tranches on the iTraxx Europe Index and iTraxx Crossover Index, posting increases of 69% and 56%, respectively, compared to tranches on CDX North America Investment Grade and CDX North America High Yield, which posted increases of 23% and 30%, respectively. The uncertainty in credit markets in 2023 appeared to provide opportunities for market participants to benefit from correlation trading, as well as access or hedge specific parts of the credit default curves.

Exhibit 6: iTraxx/CDX Indices Tranches Notional Traded

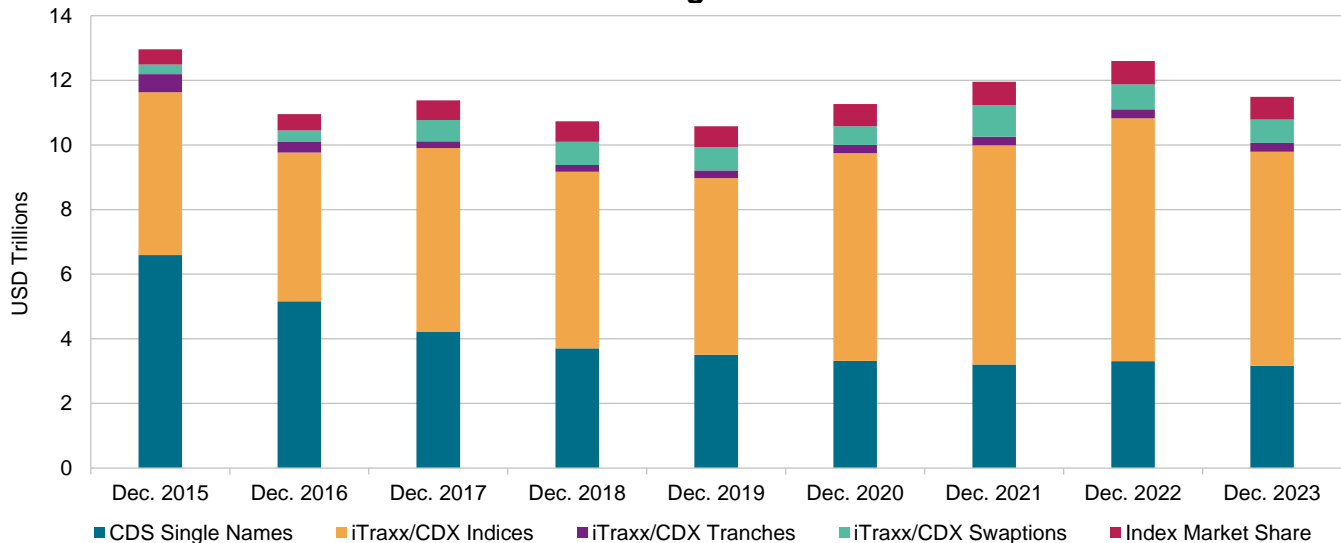


Source: Depository Trust & Clearing Corporation, [CDS Kinetics Service | DTCC Liquidity & Benchmark Analytics Consulting](#). Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

CDS Notional Outstanding

CDS index products continued to show significant market presence, with an estimated notional outstanding of over USD 7.6 trillion as of year-end 2023, representing over 70% of all CDS notional outstanding, up from about 51% as of year-end 2016. The overall CDS notional outstanding has stayed consistent in recent years, hovering in the USD 10-12 trillion range, closing 2023 at USD 10.8 trillion.

Exhibit 7: CDS Products Notional Outstanding

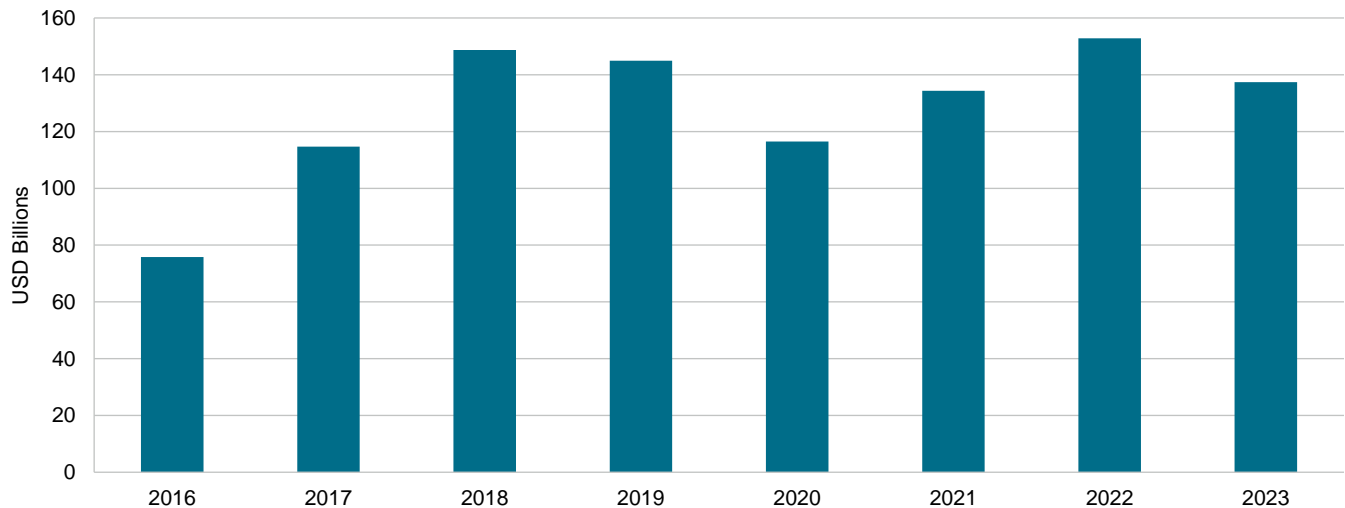


Source: Depository Trust & Clearing Corporation, [CDS Kinetics Service | DTCC Liquidity & Benchmark Analytics Consulting](#). Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes

Standardized TRS on iBoxx Indices

Standardized Total Return Swaps (TRS) on iBoxx indices traded an estimated USD 137 billion in notional in 2023. Trading volumes in 2023 were slightly lower than 2022’s record year of USD 153 billion. However, they were still marginally up from 2021’s trading volume of USD 134 billion.

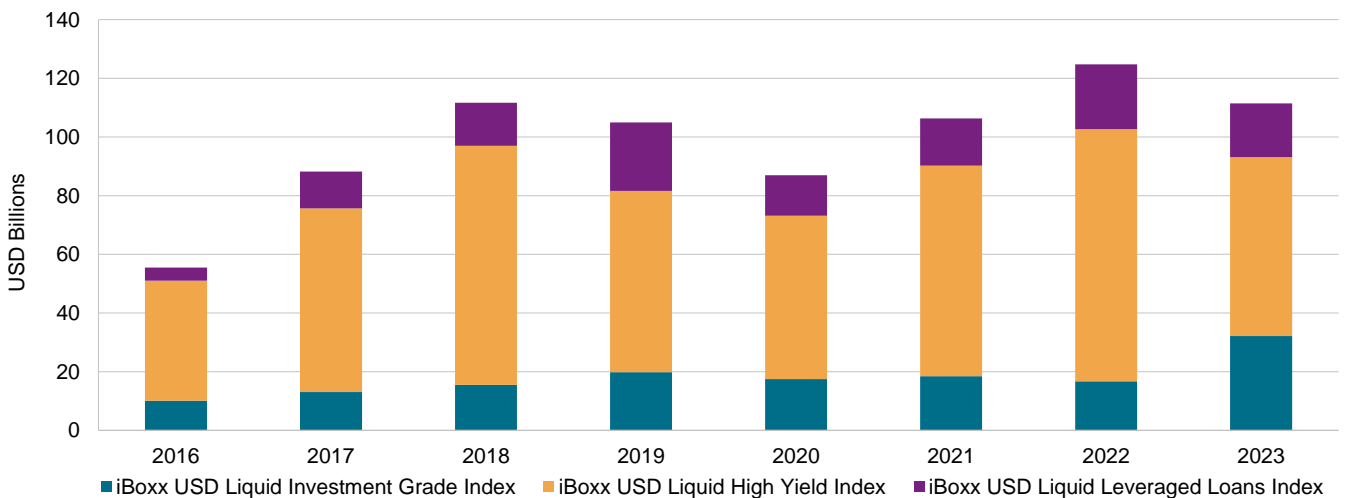
Exhibit 8: iBoxx Indices Standardized TRS



Source: Depository Trust & Clearing Corporation, [CDS Kinetics Service | DTCC Liquidity & Benchmark Analytics Consulting](#). Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes.

iBoxx USD indices saw an estimated USD 111 billion of notional traded in 2023 across investment grade, high yield and leveraged loan indices, down 11% from 2022. It is worth noting that standardized TRS volumes on iBoxx USD Liquid Investment Grade Index almost doubled from USD 17 billion in 2022 to USD 32 billion in 2023.

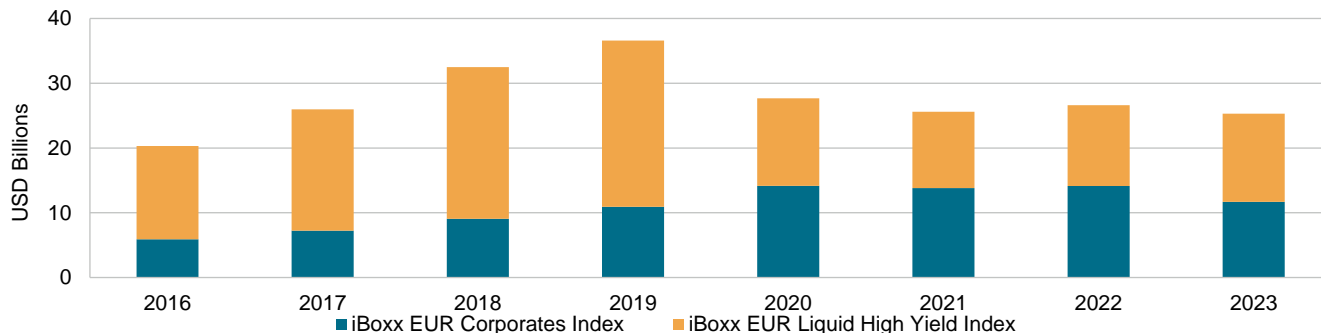
Exhibit 9: iBoxx USD Indices Standardized TRS



Source: Depository Trust & Clearing Corporation. Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes

Volumes on iBoxx EUR indices were marginally down to USD 25.3 billion in 2023 from USD 26.6 billion in 2022. The volumes on iBoxx EUR indices were more or less evenly split across investment grade and high yield, at USD 11.7 billion and USD 13.6, respectively.

Exhibit 10: iBoxx EUR Indices Standardized TRS



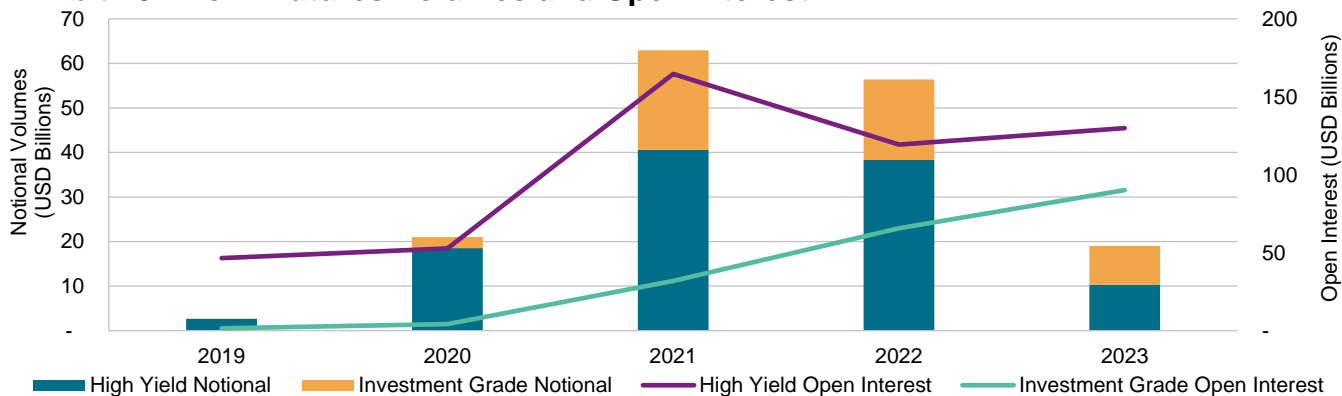
Source: Depository Trust & Clearing Corporation, [CDS Kinetics Service | DTCC Liquidity & Benchmark Analytics Consulting](#). Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes

Futures on iBoxx Indices

Futures contracts tracking the iBoxx iShares USD Corporate Bond Indices are intended to provide a means for market participants to gain beta exposure to the USD corporate bond market in an unfunded manner, either long or short. These futures are exchange traded, so they offer continuous pricing as well as favorable tax treatment of the futures wrapper. These contracts also allow investors to express views on the high yield and investment grade USD corporate bond markets.

iBoxx index futures trading volumes for 2023 showed a sizeable year-over-year decrease (USD 19 billion versus USD 56 billion). This reflects a change from quarterly to monthly settlement, but not necessarily a pure reduction of activity. Last year, open interest increased in for both high yield and investment grade. 2023 saw advances in the futures market linked to iBoxx indices, with the launch of options related to the futures tracking iBoxx indices.

Exhibit 10: iBoxx Futures Volumes and Open Interest



Source: Depository Trust & Clearing Corporation, [CDS Kinetics Service | DTCC Liquidity & Benchmark Analytics Consulting](#). Data as of Dec. 31, 2023. Past performance is no guarantee of future results. Chart is provided for illustrative purposes

Bid-Ask Spread Analysis

The bid-ask spread is a key liquidity and trade efficiency measure in financial markets, representing an estimate of the cost of trading. In 2023, the average bid-ask spreads for various instruments linked to S&P DJI credit indices varied across market segments. However, the main takeaway is that the bid-ask spreads for the tradeable index products were meaningfully lower than for the individual bonds that comprise iBoxx indices used to define key market segments, highlighting the potential liquidity and trade efficiency advantages of index-tracking tradeable tools for investors.

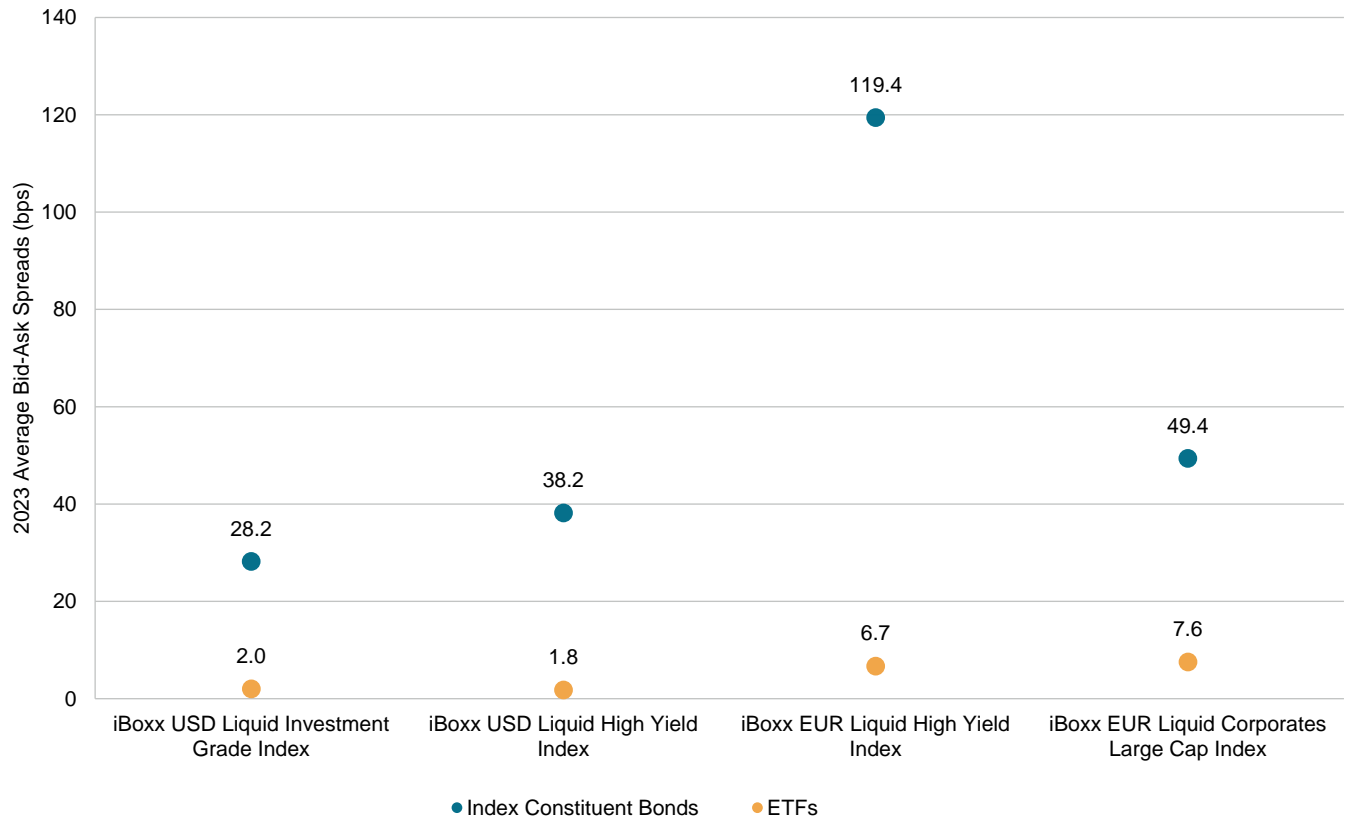
Exhibit 11: Average Bid-Ask Spreads for Instruments Linked to the S&P DJI Credit Indices

Instruments	Exposure	Underlying Index	2023 Average Bid-Ask Spread (bps)
Index Constituent Bonds	EUR Investment Grade	iBoxx EUR Liquid Corporates Large Cap Index	49.4
	EUR High Yield	iBoxx EUR Liquid High Yield Index	119.4
	USD Investment Grade	iBoxx USD Liquid Investment Grade Index	28.2
	USD High Yield	iBoxx USD Liquid High Yield Index	38.2
ETFs	EUR Investment Grade	iBoxx EUR Liquid Corporates Large Cap Index	7.6
	EUR High Yield	iBoxx EUR Liquid High Yield Index	6.7
	USD Investment Grade	iBoxx USD Liquid Investment Grade Index	2.0
	USD High Yield	iBoxx USD Liquid High Yield Index	1.8
Swaps on iTraxx/CDX Indices	EUR Investment Grade	iTraxx Europe Index	1.0
	EUR High Yield	iTraxx Crossover Index	4.9
	USD Investment Grade	CDX North America Investment Grade	1.0
	USD High Yield	CDX North America High Yield	3.3
iBoxx TRS	EUR Investment Grade	iBoxx EUR Corporates Index	39
	EUR High Yield	iBoxx EUR Liquid High Yield Index	47
	USD Investment Grade	iBoxx USD Liquid Investment Grade Index	36
	USD High Yield	iBoxx USD Liquid High Yield Index	30
iBoxx Futures	USD Investment Grade	iBoxx iShares USD High Yield Corporate Bond Index	6.6
	USD High Yield	iBoxx iShares USD Investment Grade Corporate Bond Index	6.8

Source: S&P Dow Jones Indices LLC, S&P Global Market Intelligence, CBOE. Data as of Dec. 31, 2023. For iTraxx/CDX Indices, the bid-ask spreads reflect the five-year tenors of the on-the-run series of the respective indices. For iBoxx TRS, the bid-ask spreads are for iBoxx TRS contracts maturing within the following three-month period. Table is provided for illustrative purposes.

Exhibit 12 compares the bid-ask spreads of ETFs tracking key iBoxx credit indices with the weighted average bid-ask spreads of the individual bonds within the indices. The distance between the top and bottom dots indicates the average cost savings in 2023 from transacting in the ETF tracking a given iBoxx index rather than replicating the index using individual bonds. In all cases, the ETF had lower bid-ask spreads. The difference was most notable for the iBoxx Euro Liquid High Yield Index.

Exhibit 12: Bid-Ask Spreads Cash Bonds versus ETFs



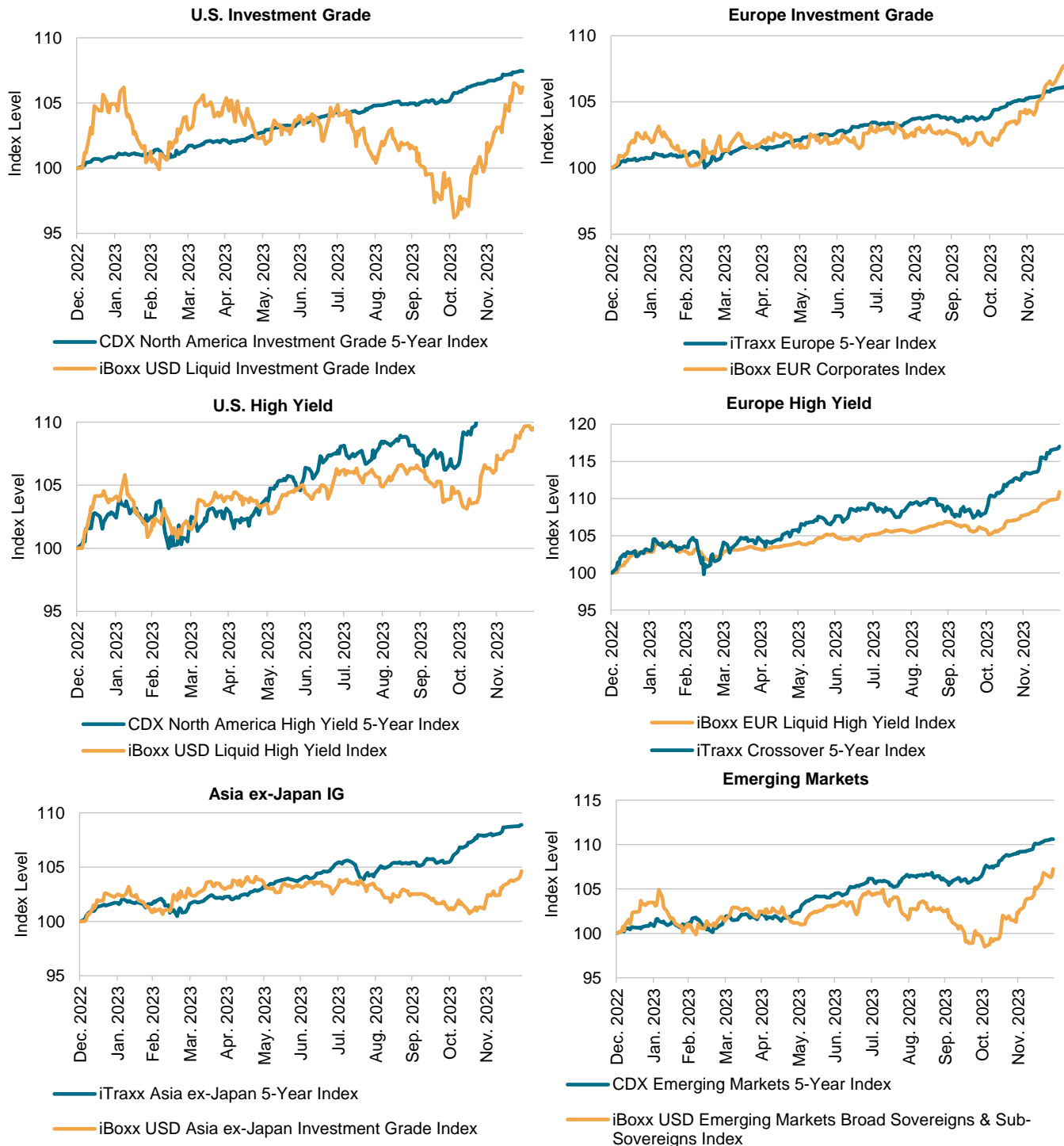
Source: S&P Dow Jones Indices LLC, S&P Global Market Intelligence. Data as of Dec. 31, 2023. Chart is provided for illustrative purposes.

Conclusion

Fixed income indices and tradeable products tracking them continue to modernize the bond markets. They provide transparency and a bond market standardization method, as well as offering single-point tools. Robust volumes, relatively tighter bid-ask spreads to underlying bonds and tradeable tools linked to key market measures underscore index tools' benefits.

Appendix

Exhibit 13: Performance of Global Credit Markets



Source: S&P Dow Jones Indices LLC, [iBoxx Indices Web \(ihsmarkit.com\)](https://www.ibox.com/indices). Data as of Dec. 31, 2023. Index performance based on total return. Past performance is no guarantee of future results. Charts are provided for illustrative purposes.

Performance Disclosure/Back-Tested Data

The CDX/Cboe NA Investment Grade 1-Month Volatility Index (BP Volatility), iTraxx/Cboe Europe Main 1-Month Volatility Index (BP Volatility), CDX/Cboe NA High Yield 1-Month Volatility Index (BP Volatility) and iTraxx/Cboe Europe Crossover 1-Month Volatility Index (BP Volatility) were launched Oct. 13, 2023. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance, and is based on the index methodology in effect on the index launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Complete index methodology details are available at www.spglobal.com/spdji. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations. Back-tested performance is for use with institutions only; not for use with retail investors.

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Index returns shown do not represent the results of actual trading of investable assets/securities. S&P Dow Jones Indices maintains the index and calculates the index levels and performance shown or discussed but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the Index or investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

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