Bond Market Update

May 2022

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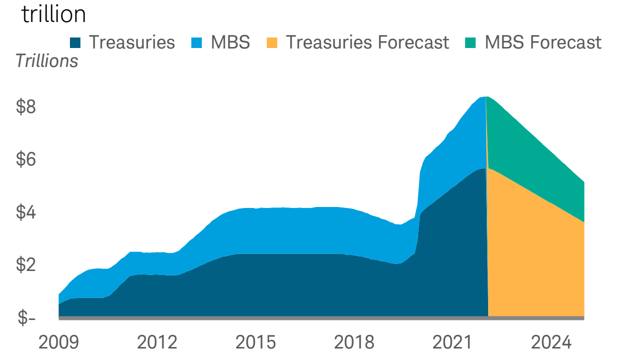
Municipal Bonds

Schwab Center for Financial Research perspective

- **Fed accelerates pace of tightening.** As expected, the Fed hiked the fed funds rate by 50 basis points and launched its balance sheet runoff. It will allow the Treasuries and mortgage-backed securities it holds to mature and roll off the balance sheet rather than reinvesting the proceeds. Based on peak monthly caps of $95 billion, it should take several years for the total holdings to get back to the pre-pandemic level of 20% of GDP.
- **Real yields are approaching zero.** A "normal" Fed policy would see real rates in positive territory. We see this as a potential opportunity to lock in positive real yields for the first time in several years.
- **The dollar is up sharply, contributing to tighter financial conditions.** With the Fed moving rates up faster than other developed market central banks, higher relative U.S. yields make holding dollars more attractive. High volatility, global growth concerns and demand for liquidity also lend support to the dollar.
- **Consider modestly extending duration.** We believe Treasury yields have limited upside given expectations of a Fed funds terminal rate of roughly 3.0% to 3.25%, so consider adding exposure to some intermediate- or longer-term bonds as the 10-year Treasury yield approaches 3%. Bond ladders are a good strategy when yields are rising.

The Fed's balance sheet has ballooned to more than $8 trillion

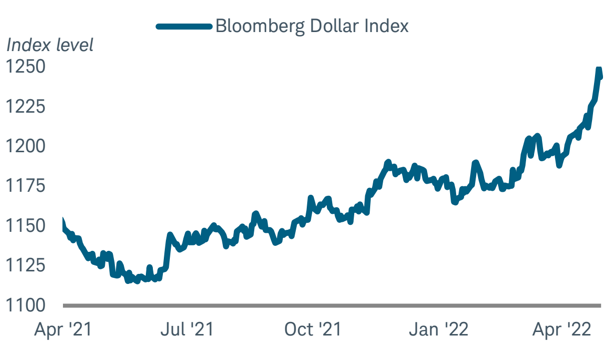


Source: Bloomberg. Reserve Balance Wednesday Close for Treasury Bills, Treasury Notes, Treasury Bonds, Treasury Inflation Protected Securities, and Mortgage-Backed Securities. Monthly data as of 4/29/2022.

Real yields are approaching positive territory

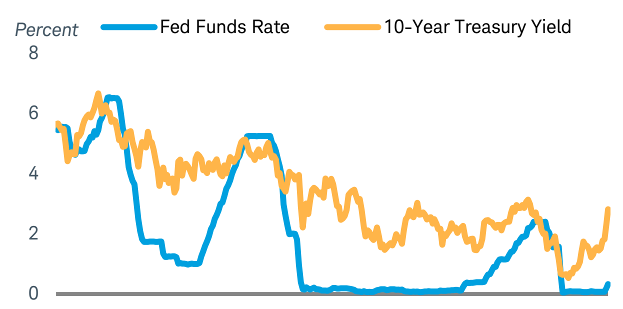
Source: Bloomberg. US Generic Govt TII 10 Yr (USGGT10Y INDEX) and US Generic Govt TII 5 Yr (USGGT05Y INDEX). Daily data as of 4/29/2022. **Past performance is no guarantee of future results.**

Tighter Fed monetary policy has sent the dollar soaring.



Source: Bloomberg. Bloomberg U.S. Dollar Index (BBDXY Index). Daily data as of 4/29/2022. **Past performance is no guarantee of future results.**

The Fed funds rate and 10-year treasury yields tend to peak around the same level



Source: Bloomberg. Effective Federal Funds Rate and U.S. 10-Year Treasury Yield (FEDL01 Index, USGG10YR Index). Monthly data as of 4/28/2022. **Past performance is no guarantee of future results.**

Corporate Bond Market Update

May 2022

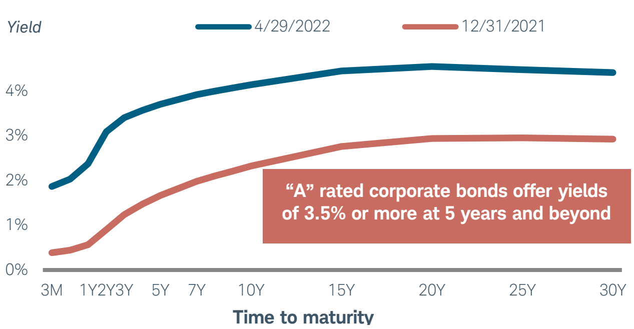
Collin Martin, CFA

Director, Fixed Income Strategist
Taxable Asset Classes

Schwab Center for Financial Research perspective

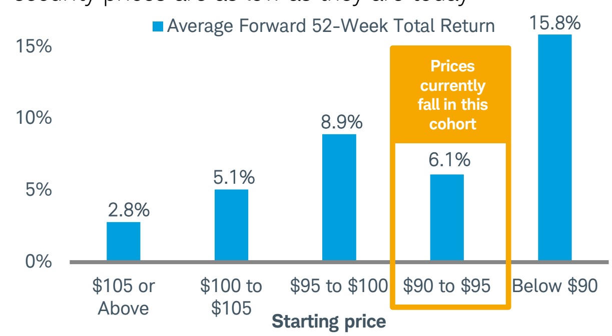
- **Focus on credit quality.** Investors don't need to take much credit risk to earn higher yields today. Investment grade corporate bonds rated "A" with maturities of 5 years offer average yields of roughly 3.5%.
- **The entry point for preferred securities is looking attractive.** The $91 average price of the ICE BofA Fixed Rate Preferred Securities has rarely been lower. Price declines are still possible if long-term yields move higher, but investors with a long-term investing horizon should consider preferreds given the sharp rise in yields.
- **Cracks are forming in the high-yield bond market.** Credit spreads resumed their upward trend in April, led by a rise in CCC rated bonds, due to expectations for an aggressive pace of Federal Reserve rate hikes. High-yield bonds tend to perform poorly when the yield curve is flat or inverted. Rather than chase yield in the junk-bond market, we suggest investors move up in quality.
- **Rising rates are a double-edged sword for bank loans.** Bank loan income payments should rise as the Fed hikes rates, but that should also translate into higher interest expenses, eating into corporate profits. Bank loans have low interest rate risk but high credit risk, and prices can still fall sharply in "risk-off" periods.

"A" rated corporate bond yields are up sharply this year



Source: Bloomberg, as of 4/29/2022. US Treasury Actives Curve (YCGT0025 Index) and USD US Corporate IG BVAL Yield Curve (BVSC0076 Index). **Past performance is no guarantee of future results.**

Average total returns have been high when preferred security prices are as low as they are today



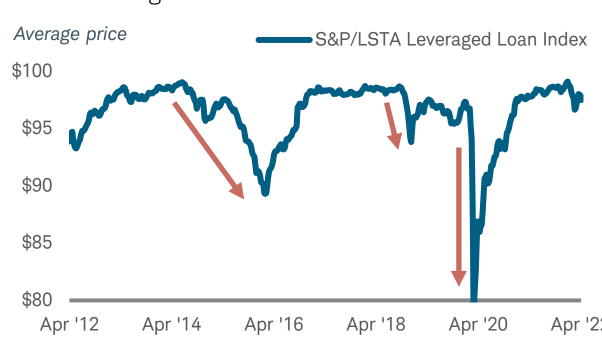
Source: Schwab Center for Financial Research and Bloomberg. Forward 52-week total returns of the ICE BofA Fixed Rate Preferred Securities Index using weekly data from 5/5/1989 through 4/29/2022. **Past performance is no guarantee of future results**

A flat yield curve usually spells trouble for HY bonds

Starting Yield Curve Slope	Average Next 12-Month Relative Return	
	2-yr/10-yr Curve	3-mo/10-yr Curve
Less than zero	-7.3%	-6.6%
Between 0 and 100 basis points	1.3%	-1.6%
Between 100 and 200 basis points	5.0%	4.5%
Above 200 basis points	9.7%	7.1%

Source: Bloomberg. Relative returns compare the average 12-month total returns of the Bloomberg U.S. Corporate High-Yield Bond Index (LF98TRUU) and the Bloomberg Intermediate Treasury Index (LT08TRUU Index) depending on the starting slope of the 3-month/10-year and 2-year/10-year Treasury yield curves, using monthly data from January 1984 through April 2022. **Past performance is no guarantee of future results.**

Despite their low interest rate risk, bank loan prices can still suffer large drawdowns



Source: Bloomberg, using weekly data as of 4/29/2022. S&P/LSTA Leveraged Loan Price Index (SPBDALB Index). **Past performance is no guarantee of future results.**

Municipal Bond Market Update

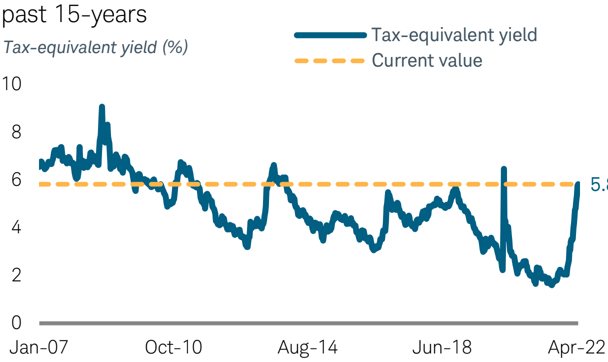
May 2022

Cooper Howard, CFA
Director, Fixed Income Strategist
Municipal Bonds

Schwab Center for Financial Research perspective

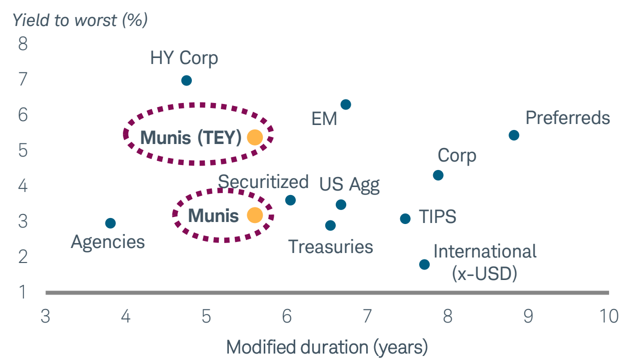
- **Muni yields look compelling.** Both absolute and relative yields have moved significantly higher to start the year and are attractive at these levels in our view. With the move up in yields, we suggest starting to extend duration. For reference, the duration of the Bloomberg Municipal Bond Index is 5.5 years. For more, read our recent report.
- **Be cautious of the de minimis tax given the recent rise in yields.** If a muni bond is bought at a price below the de minimis threshold the accretion back to par is usually taxed as ordinary income rather than capital gains. Ordinary income taxes are higher so the de minimis tax can reduce the after-tax return. Bonds with lower coupon structures are more likely to trade below par and potentially be subject to the de minimis tax.
- **Modestly add some lower rated issuers.** Favorable credit conditions and more attractive valuations support adding some lower rated (A/A and BBB/Baa) issuers. The ongoing economic recovery, combined with the multiple rounds of federal aid, have helped bolster most state and local governments' finances. A word of warning with BBB rated issuers – nearly 50% of the broad BBB index is made up of only 10 issuers which can make finding enough issuers for adequate diversification a potential issue.

Tax-equivalent yields have rarely been higher over the past 15-years



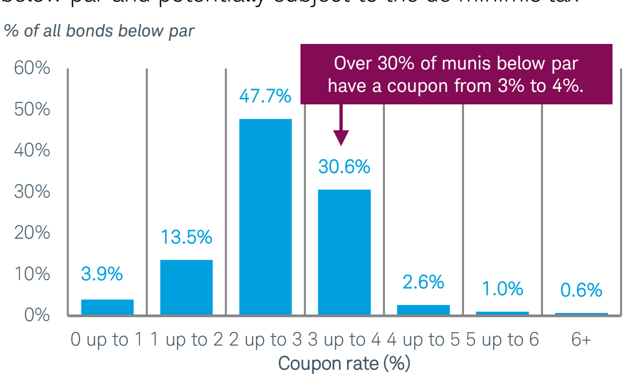
Source: Bloomberg Municipal Bond Index. As of 4/29/22 using weekly data. Munis assume a Federal tax rate of 35% from '06 to '12, 39.6% from '13 to '17, and 37% from '18 to '22, a 5% state income tax rate, and a 3.8% ACA tax from '13 to '22. **Past performance is no guarantee of future results.**

Munis offer an attractive balance of yield relative to duration risk in our view



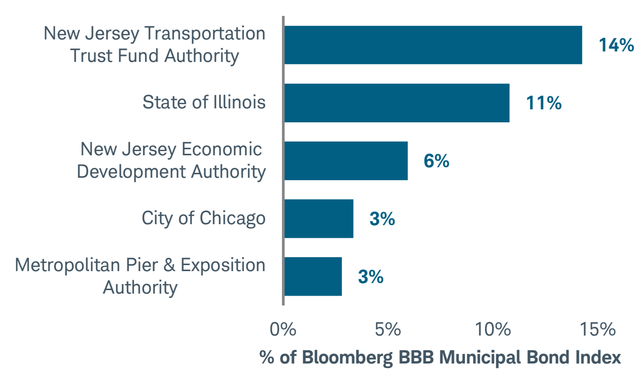
Source: Bloomberg. As of 4/29/22. The tax-equivalent-yield (TEY) for munis assumes a 37% Federal tax rate and 3.8% ACA tax rate. **Past performance is no guarantee of future results.**

Bonds with lower coupons are more likely to be trading below par and potentially subject to the de minimis tax



Source: Bloomberg, as of 4/27/22. **Past performance is no guarantee of future results.**

Five issuers account for roughly one-third of all issuers in the BBB index.



Source: Bloomberg BBB Municipal Bond Index, as of 4/27/22. All names and market data shown above are for illustrative purposes only and are not a recommendation, offer to sell, or a solicitation of an offer to buy any security. **Past performance is no guarantee of future results.**

Fixed Income Market Snapshot

May 2022

Total returns

	YTD	1-month
US Aggregate	-9.5%	-3.8%
Treasuries	-8.5%	-3.1%
TIPs	-5.0%	-2.0%
Securitized	-8.2%	-3.4%
Municipals	-8.8%	-2.8%
Investment grade corporates	-12.7%	-5.5%
High yield corporates	-8.5%	-3.9%
Bank loans	-0.3%	-0.1%
Preferreds	-11.8%	-5.5%
Int'l Developed (x-USD)	-12.6%	-6.8%
Emerging market	-13.2%	-4.3%

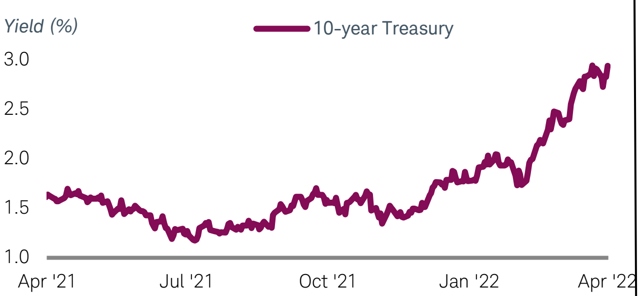
Source: Bloomberg. Returns from 12/31/2021 through 4/29/2022. Returns assume reinvestment of interest and capital gains. See disclosures for indexes used. **Past performance is no guarantee of future results.**

Key metrics

	Current	One-month ago
2-yr. Treasury yield (%)	2.72	2.34
5-yr. Treasury yield (%)	2.96	2.46
10-yr. Treasury yield (%)	2.94	2.34
30-yr. Treasury yield (%)	3.00	2.45
10-yr. TIPS Breakeven (%)	2.94	2.83
2/10 Spread (BPS)	21.3	-0.1
Dollar Index	1,245.0	1,191.8
5-yr. MOB spread (%)	84.5	82.3
10-yr. MOB spread (%)	92.4	95.3
IG Corporate OAS (BPS)	135	116
HY Corporate OAS (BPS)	378	316

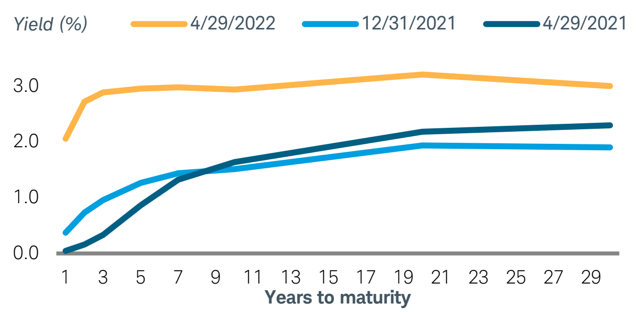
Source: Bloomberg, as of 3/31/2022. **Past performance is no guarantee of future results.**

10-year U.S. Treasury yield



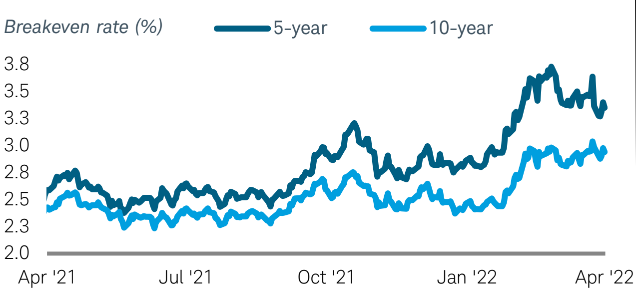
Source: Bloomberg, as of 4/29/2022. US Generic Govt 10 Yr. (USGG10YR Index). **Past performance is no guarantee of future results.**

Treasury yield curve



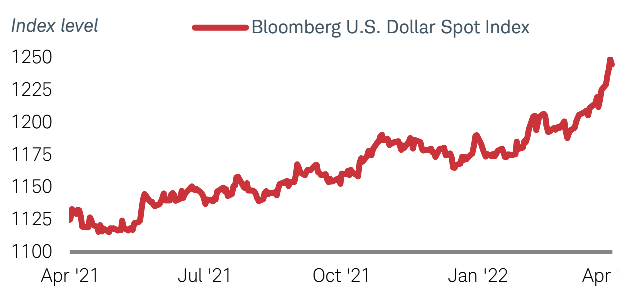
Source: Bloomberg, as of 4/29/2022. **Past performance is no guarantee of future results.**

TIPS breakeven rates



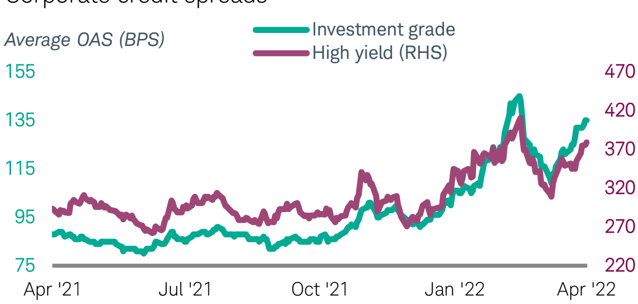
Source: Bloomberg, as of 4/29/2022. U.S. Breakeven 5 Year (USGGBE05 Index) US Breakeven 10 Year (USGGBE10 Index).

The U.S. dollar



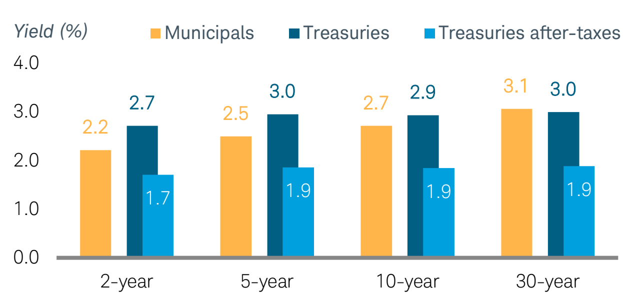
Source: Bloomberg, as of 4/29/22. Bloomberg U.S. Dollar Spot Index (BBDXY Index). **Past Performance is no guarantee of future results.**

Corporate credit spreads



Source: Bloomberg, as of 4/29/2022. Bloomberg U.S. Corporate Bond Index (LUACTRUU) and Bloomberg U.S. Corporate High-Yield Bond Index (LF98TRUU Index). OAS is quoted as a fixed spread, or differential, over U.S. Treasury issues.

Municipal bond yields



Source: Bloomberg, as of 4/29/2022. Treasuries assume a 37% Federal tax rate. **Past performance is no guarantee of future results.**

Important Disclosures

All views and opinions in this update are as of May 4, 2022.

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Investing involves risk including loss of principal.

Fixed income securities are subject to increased loss of principal during periods of rising interest rates. Fixed-income investments are subject to various other risks including changes in credit quality, market valuations, liquidity, prepayments, early redemption, corporate events, tax ramifications and other factors.

High-yield bonds and lower rated securities are subject to greater credit risk, default risk, and liquidity risk.

Tax-exempt bonds are not necessarily suitable for all investors. Information related to a security's tax-exempt status (federal and in-state) is obtained from third parties, and Schwab does not guarantee its accuracy. Tax-exempt income may be subject to the alternative minimum tax. Capital appreciation from bond funds and discounted bonds may be subject to state or local taxes. Capital gains are not exempt from federal income tax.

Treasury Inflation Protected Securities (TIPS) are inflation-linked securities issued by the US Government whose principal value is adjusted periodically in accordance with the rise and fall in the inflation rate. Thus, the dividend amount payable is also impacted by variations in the inflation rate, as it is based upon the principal value of the bond. It may fluctuate up or down. Repayment at maturity is guaranteed by the US Government and may be adjusted for inflation to become the greater of the original face amount at issuance or that face amount plus an adjustment for inflation.

Bank loans are typically below investment-grade credit quality and may be subject to more credit risk, including the risk of nonpayment of principal or interest. Most bank loans are floating rate, with interest rates that are tied to LIBOR or another short-term reference rate, so substantial increases in interest rates may make it more difficult for issuers to service their debt and cause an increase in loan defaults. Bank loans are typically secured by collateral posted by the issuer, or guarantees of its affiliates, the value of which may decline and be insufficient to cover repayment of the loan. Many loans are relatively illiquid or are subject to restrictions on resales, have delayed settlement periods, and may be difficult to value. Bank loans are also subject to maturity extension risk and prepayment risk.

International investments involve additional risks, which include differences in financial accounting standards, currency fluctuations, geopolitical risk, foreign taxes and regulations, and the potential for illiquid markets. Investing in emerging markets may accentuate these risks.

Preferred securities are often callable, meaning the issuing company may redeem the security at a certain price after a certain date. Such call features may affect yield. Preferred securities generally have lower credit ratings and a lower claim to assets than the issuer's individual bonds. Like bonds, prices of preferred securities tend to move inversely with interest rates, so they are subject to increased loss of principal during periods of rising interest rates. Investment value will fluctuate, and preferred securities, when sold before maturity, may be worth more or less than original cost. Preferred securities are subject to various other risks including changes in interest rates and credit quality, default risks, market valuations, liquidity, prepayments, early redemption, deferral risk, corporate events, tax ramifications, and other factors.

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A bond ladder, depending on the types and amount of securities within the ladder, may not ensure adequate diversification of your investment portfolio. This potential lack of diversification may result in heightened volatility of the value of your portfolio. You must perform your own evaluation of whether a bond ladder and the securities held within it are consistent with your investment objective, risk tolerance and financial circumstances.

Currencies are speculative, very volatile and are not suitable for all investors.

Diversification strategies do not ensure a profit and do not protect against losses in declining markets.

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Index Definitions

Indexes are unmanaged, do not incur management fees, costs and expenses, and cannot be invested in directly.

The **Bloomberg U.S. Aggregate Index** ("Core Bonds") represents securities that are SEC-registered, taxable, and dollar denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities. These major sectors are subdivided into more specific indices that are calculated and reported on a regular basis.

The **ICE BofA Fixed Rate Preferred Securities Index** ("Preferred Securities") tracks the performance of fixed-rate USD-denominated preferred securities issued in the U.S. domestic market.

The **S&P 500 Index** measures the performance of 500 leading publicly traded U.S. companies from a broad range of industries. It is a float-adjusted market-capitalization weighted index.

The **S&P 500 Dividend Aristocrats** measure the performance of S&P 500 companies that have increased dividends every year for the last 25 consecutive years. The Index treats each constituent as a distinct investment opportunity without regard to its size by equally weighting each company.

The **Bloomberg U.S. Corporate Bond Index** ("IG Corporate Bonds") covers the U.S. dollar (USD)-denominated investment-grade, fixed-rate, taxable corporate bond market. Securities are included if rated investment-grade (Baa3/BBB-/BBB-) or higher using the middle rating of Moody's, S&P and Fitch ratings services. This index is part of the Bloomberg Barclays U.S. Aggregate Bond Index (Agg

The **Bloomberg U.S. Treasury Index** ("U.S. Treasury Bonds") includes public obligations of the U.S. Treasury excluding Treasury Bills and U.S. Treasury TIPS. The index rolls up to the U.S. Aggregate. Securities have $250 million minimum par amount outstanding and at least one year until final maturity.

The **Bloomberg U.S. Corporate High-Yield Bond Index** ("HY Corporate Bonds") covers the USD-denominated, non-investment grade, fixed-rate, taxable corporate bond market. Securities are classified as high-yield if the middle rating of Moody's, Fitch, and S&P is Ba1/BB+/BB+ or below.

The **Bloomberg U.S. Municipal Bond Index** ("Municipal Bonds") is a broad-based benchmark that measures the investment grade, U.S. dollar-denominated, fixed tax-exempt bond market. The index includes state and local general obligation, revenue, insured and pre-refunded bonds. The AAA, AA, A, Baa, 1 Year (1-2), 3 Year (2-4), 5 Year (4-6), 7 Year (6-8), 10 Year (8-12), 15 Year (12- 17), 20 Year (17-22), and Long Bond (22+) are all subindices.

The **Bloomberg Emerging Markets USD Aggregate Bond Index** ("EM USD Bonds") includes USD-denominated debt from emerging markets in the following regions: Americas, Europe, Middle East, Africa, and Asia.

The **Bloomberg US Mortgage-Backed Securities** Index measures the performance of mortgage pass-through securities guaranteed by the Government National Mortgage Association (Ginnie Mae),the Federal National Mortgage Association (Fannie Mae), and the Federal Home Loan Mortgage Corporation (Freddie Mac). It is constructed by grouping individual mortgage-backed security pools into aggregates or generics based on program, coupon, and vintage. It is a market-value weighted index.

The **Bloomberg Securitized Bond Index** ("Securitized") represents the securitized section of the Barclays US Aggregate.

The **Bloomberg U.S. Treasury Inflation Protected Securities (TIPS) Index** ("TIPS") is a market value-weighted index that tracks inflation-protected securities issued by the U.S. Treasury. To prevent the erosion of purchasing power, TIPS are indexed to the non-seasonally adjusted Consumer Price Index for All Urban Consumers, or the CPI-U (CPI).

The **Bloomberg Global Aggregate ex USD Bond Index** ("Int'l Developed Bonds (x-USD") provides a broad-based measure of the global investment-grade fixed-rate debt markets. The two major components of this index are the Pan-European Aggregate, and the Asian-Pacific Aggregate Indices.

Source: Bloomberg Index Services Limited. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively "Bloomberg"). BARCLAYS® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates, "Barclays"), used under license. Bloomberg or Bloomberg's licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays approves or endorses this material or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

The **Bloomberg U.S. Dollar Spot Index** (Rebased Version) tracks the performance of a basket of ten leading global currencies versus the U.S. Dollar. Each currency in the basket and their weight is determined annually based on their share of international trade and FX liquidity. The BBDX Index data starts from Apr 5, 2016, with a base level of 100.