



GLOBAL NON-INVESTMENT GRADE CREDIT TEAM

Navigating Volatility in Global Non-Investment Grade Credit Markets

The coronavirus has caused severe disruption to the economy and financial markets as the world has sought to contain its spread. Although the resulting volatility is likely to continue, we believe that high yield spreads and loan prices are at levels suggesting attractive valuations for long-term investors to begin adding exposure, based on historical experience. Credit selection, including the avoidance of defaults, should also be a key factor in determining future return profiles.

Overview

Non-investment grade credit markets continue to experience significant volatility due to the spread of COVID-19 and its impact on global economic activity from business closures, closed borders and shelter-in-place orders, as well as an oil price war made worse by demand destruction. Central banks around the world are taking extraordinary measures to provide liquidity to ensure the proper functioning of capital markets and to ensure that credit channels are open to businesses and households during this crisis. Additionally, very large fiscal stimulus packages are being rolled out to shore up both businesses and consumers while many non-essential activities have been shut down in an effort to “flatten the curve” of the virus.

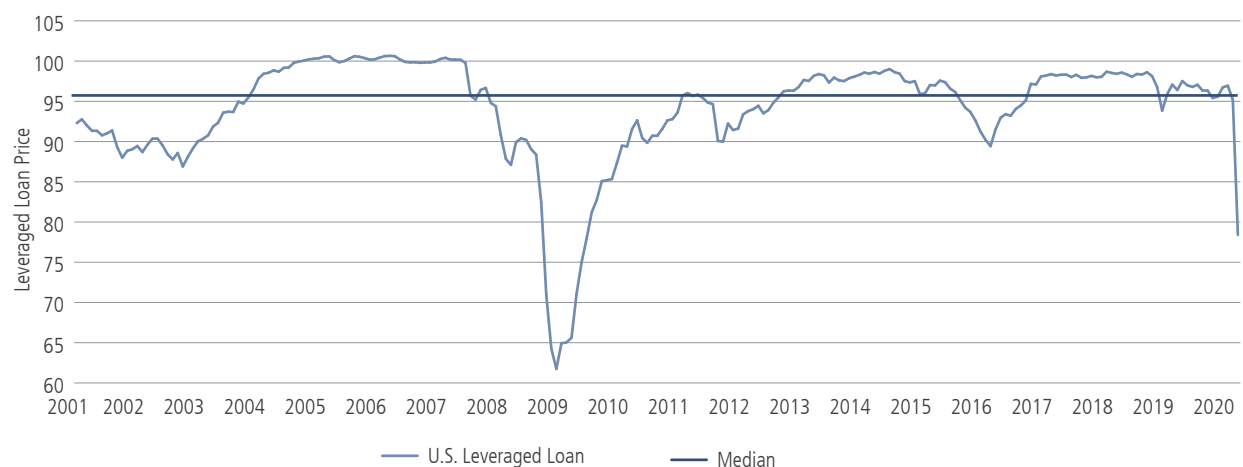
In this environment, credit spreads in U.S. and global high yield markets have widened toward the 1,000-plus basis-point level and leveraged loan U.S. dollar prices have declined into the 70s. While volatility may continue, these levels have been attractive entry points for long-term investors in past periods of market dislocation.

FIGURE 1. U.S. HIGH YIELD SPREAD (BASIS POINTS)



Source: ICE BofA Indexes.

FIGURE 2. U.S. LOANS WEIGHTED AVERAGE BID PRICE (\$)



Source: S&P LSTA.

With Increased Volatility and Uncertainty Comes Opportunity

Following the recent and rapid spread-widening and loan price declines, we believe that while volatility may persist, based on history, this could be an attractive entry point for long-term investors. Historically, when U.S. high yield spread levels have crossed +900 basis points, prospective long-term returns have, on average (based on median annualized index returns for 12-month, 24-month, 36-month, 48-month and 60-month periods), been in the double-digit range.

FIGURE 3. U.S. HIGH YIELD BOND PERFORMANCE AFTER SPREADS EXCEED 900 BASIS POINTS

| High Yield Annualized Returns | | | | | |
|-------------------------------|-------|-------|-------|-------|-------|
| | 1yr | 2yr | 3yr | 4yr | 5yr |
| Average | 34.7% | 24.6% | 19.6% | 16.7% | 15.3% |
| Median | 36.9% | 25.5% | 20.8% | 17.1% | 16.6% |
| High | 61.4% | 36.9% | 25.9% | 23.5% | 20.5% |
| Low | 0.5% | 4.9% | 11.8% | 11.0% | 9.7% |
| Positive | 25 | 25 | 25 | 25 | 25 |
| Negative | — | — | — | — | — |

| BB Annualized Returns | | | | | |
|-----------------------|-------|-------|-------|-------|-------|
| | 1yr | 2yr | 3yr | 4yr | 5yr |
| Average | 22.4% | 17.7% | 15.0% | 12.9% | 12.0% |
| Median | 21.8% | 18.2% | 15.4% | 13.0% | 12.6% |
| High | 43.9% | 28.7% | 21.2% | 19.6% | 16.6% |
| Low | 5.6% | 8.6% | 9.1% | 9.0% | 7.8% |
| Positive | 25 | 25 | 25 | 25 | 25 |
| Negative | — | — | — | — | — |

| B Annualized Returns | | | | | |
|----------------------|-------|-------|-------|-------|-------|
| | 1yr | 2yr | 3yr | 4yr | 5yr |
| Average | 29.2% | 22.3% | 18.2% | 15.7% | 14.5% |
| Median | 29.4% | 22.4% | 17.4% | 16.6% | 14.8% |
| High | 46.8% | 31.5% | 27.0% | 20.3% | 19.3% |
| Low | 3.2% | 6.6% | 9.3% | 11.6% | 10.2% |
| Positive | 25 | 25 | 25 | 25 | 25 |
| Negative | — | — | — | — | — |

| CCC Annualized Returns | | | | | |
|------------------------|--------|-------|-------|-------|-------|
| | 1yr | 2yr | 3yr | 4yr | 5yr |
| Average | 62.8% | 38.8% | 29.3% | 23.7% | 21.3% |
| Median | 59.3% | 37.0% | 29.5% | 22.1% | 21.6% |
| High | 128.4% | 67.8% | 43.7% | 35.9% | 31.1% |
| Low | -8.4% | -3.0% | 13.3% | 14.5% | 10.7% |
| Positive | 22 | 24 | 25 | 25 | 25 |
| Negative | 3 | 1 | — | — | — |

Source: JPM High-Yield and Leveraged Loan Morning Intelligence. Data as March 20, 2020. U.S. High Yield bond performance is measured by the J.P. Morgan Domestic High Yield. See definitions of indices at the end of this paper. Indices are unmanaged and are not available for direct investments. Investing entails risks, including possible loss of principal. **Past performance is not necessarily indicative of future results.** As with any investment, there is the possibility of profit as well as the risk of loss. Historical trends do not imply, forecast, or guarantee future results.

While there is no guarantee that prior experiences will be repeated, the above analysis is a useful tool to calibrate relative valuations and assess the range of potential outcomes.

Implied Versus Actual Default Rates

While high yield and loan market default rates were well below long-term averages as of February, we expect default rates to increase in the months ahead given the unprecedented temporary shutdown of non-essential economic activity, the impact to demand and the sharp fall in oil prices. As recently as last month, defaults were primarily driven by energy and idiosyncratic credits that were having trouble in a lower-growth environment. The unusual nature of the current “mandated” economic stall and uncertainty as to the timing of restarting the economy make it difficult to forecast in the near term. That said, we can look to what is implied in current spreads and valuations in high yield and loans. Spreads are at levels that suggest distress in these markets. The following table outlines what is imbedded in spreads for high yield and loans.

FIGURE 4. IMPLIED DEFAULTS IN NON-INVESTMENT GRADE CREDIT

| High Yield Implied Default Rate Using Spread to Worst and Ex-Energy | | | | | | | | |
|---|--|---------------|--------|----------------------|--------|----------------|--------------|-----------------|
| Spread to Worst | | Excess Spread | | Implied Default Loss | | Par – Recovery | | Implied Default |
| 1049bps | | – | 347bps | = | 702bps | / | (100% – 35%) | = 10.80% |
| Ex-Energy Spread to Worst | | Excess Spread | | Implied Default Loss | | Par – Recovery | | Implied Default |
| 936bps | | – | 347bps | = | 589bps | / | (100% – 35%) | = 9.10% |
| Loan Implied Default Rate | | | | | | | | |
| Spread to 3 Year | | Excess Spread | | Implied Default Loss | | Par – Recovery | | Implied Default |
| 1319bps | | – | 403bps | = | 916bps | / | (100% – 60%) | = 22.90% |

Source: J.P. Morgan and Neuberger Berman. Data as of March 24, 2020. High Yield data are represented by the ICE Bank of America U.S. High Yield Index. Loans are represented by S&P/LSTA Leveraged Loan Index. The dates used in this analysis represent periods of significant market events over the past 20 years. Historical trends do not imply, forecast or guarantee future results. This material is provided for informational purposes only, is as of the date hereof and is subject to change without notice. Neuberger Berman advisors and portfolio managers may make recommendations or take positions contrary to the views expressed. Nothing herein constitutes a prediction or projection of future events or future market behavior. Due to a variety of factors, actual events or market behavior may differ significantly.

Implied default rates as estimated by spreads over U.S. Treasuries assuming various recovery rates can provide an idea of what is being priced into the market. In prior episodes of spread-widening in high yield and loans, it was not unusual for spreads to overshoot or overestimate actual default rates, as reflected in the following two tables.

FIGURE 5. HIGH YIELD AND LOAN MARKETS HAVE HISTORICALLY TENDED TO OVERESTIMATE ACTUAL DEFAULT RATES
U.S. High Yield

| Dates | Spread to Worst | Implied Annual Default Rate | Year 1 | Year 2 | Year 3 | Cumulative | Expected | Market Overshoot |
|------------|-----------------|-----------------------------|--------|--------|--------|------------|----------|------------------|
| 11/30/2000 | 875 | 8.1% | 8.2% | 9.0% | 3.5% | 20.7% | 24.4% | 3.7% |
| 7/31/2002 | 960 | 9.4% | 4.9% | 2.0% | 3.7% | 10.6% | 28.3% | 17.7% |
| 3/31/2008 | 810 | 7.1% | 13.8% | 13.2% | 1.3% | 28.3% | 21.4% | -7.0% |
| 11/30/2008 | 1,940 | 24.5% | 20.7% | 1.4% | 2.2% | 24.3% | 73.5% | 49.2% |
| 9/30/2011 | 819 | 7.3% | 2.3% | 1.2% | 1.6% | 5.1% | 21.8% | 16.7% |
| 1/31/2016 | 780 | 6.7% | 5.6% | 0.9% | 2.1% | 8.5% | 20.0% | 11.5% |
| 3/23/2020 | 1,049 | 10.8% | | | | | 32.4% | TBD |

U.S. Loans

| Dates | Three-Year Discount Margin | Implied Annual Default Rate | Year 1 | Year 2 | Year 3 | Cumulative | Expected | Market Overshoot |
|------------|----------------------------|-----------------------------|--------|--------|--------|------------|----------|------------------|
| 11/30/2000 | 470 | 1.7% | 6.5% | 6.5% | 2.3% | 15.3% | 5.0% | -10.3% |
| 7/31/2002 | 559 | 3.9% | 2.6% | 0.9% | 1.5% | 5.0% | 11.7% | 6.7% |
| 3/31/2008 | 766 | 9.1% | 8.0% | 5.8% | 1.1% | 14.9% | 27.3% | 12.3% |
| 11/30/2008 | 2,208 | 45.1% | 10.8% | 2.2% | 0.2% | 13.2% | 135.3% | 122.1% |
| 9/30/2011 | 776 | 9.3% | 1.0% | 2.4% | 3.3% | 6.8% | 28.0% | 21.2% |
| 1/31/2016 | 747 | 8.6% | 1.6% | 1.9% | 1.4% | 4.9% | 25.8% | 20.9% |
| 3/20/2020 | 1,319 | 22.9% | | | | | 68.7% | TBD |

Source: J.P. Morgan and Neuberger Berman. Data as of March 24, 2020. High Yield data represented by the ICE Bank of America U.S. High Yield Index. Loans represented by S&P/LSTA. The dates used in this analysis represent periods of significant market events over the past 20 years. Historical trends do not imply, forecast or guarantee future results. This material is provided for informational purposes only, is as of the date hereof and is subject to change without notice. Neuberger Berman advisors and portfolio managers may make recommendation or take positions contrary to the views expressed. Nothing herein constitutes a prediction or projection of future events or future market behavior. Due to a variety of factors, actual events or market behavior may differ significantly.

While we would expect annual default rates to increase in 2020 toward the 8 – 10% range for U.S. high yield, 6 – 8% for global high yield and 5 – 7% for loans, similar to the 2008 and 2009 experience, at current spread levels, the market is pricing in 32% and 69% cumulative defaults for U.S. high yield and loans, respectively, versus 28% and 13% realized defaults for U.S. high yield and loans between 2009 and 2012. While the current situation is no “Global Financial Crisis,” it is a worldwide health crisis with uncertainty on duration and severity.

Navigating Current Volatility

In our view, risk assets in general are pricing in severe scenarios in large part because markets do not like low-visibility environments. As better information and data emerge as to the impact on real activity, we believe markets are likely to begin to discount reality instead of fear, and increasingly differentiate among individual companies and credits.

In our view, bottom-up, fundamental analysis of individual credits with a focus on default avoidance will continue to be the primary determinant of long-term performance in high yield and leveraged loans. Based on our assessment, many higher-quality issuers have the liquidity profiles to weather these disruptions in the intermediate term. In this initial phase of a liquidity-driven downdraft, larger, more liquid bonds and loans have been sold first, as mutual fund and ETF outflows have caused some managers to sell what they can instead of what they may want to. Historically, such gaps in performance between large, liquid issuers and the overall market have been relatively short-lived, and followed by periods in which the market sorted the issuers that could survive from those that might require restructuring or closure.

Our analysts have been running stress tests to differentiate issuers in the current environment. While the high yield and loan sectors most directly impacted by recent events include those exposed to travel, leisure, non-essential consumer discretionary, and energy and gas distribution, we think price declines for some of these issuers will likely be more transitory.

Higher defaults and permanent impairments are likely to increase among oil-focused E&P companies and among issuers with capital structures, leverage and cash flow profiles that will not be able to survive temporary or more extended shutdowns. We also believe that price declines in gas distribution issuances could prove more temporary due to lower direct commodity exposure and the critical importance of their hard assets.

Potential fallen angels and disrupted BBB issuers are providing an additional source of return potential, as an estimated \$150 to \$200+ billion of investment grade issuers could become non-investment grade. For context, back in 2016 and 2009, fallen angels amounted to \$143 billion and \$150 billion, respectively. In periods of stress, we have viewed widespread downgrades from investment grade to non-investment grade ratings as a major opportunity, allowing our global team to leverage its bottom-up, fundamental credit-selection process to invest in higher quality credits.

Stress-Testing Credits

Our Non-Investment Grade research team has stress-tested all the issuers in our portfolios based on (a) potential length of closings/ disruptions, (b) ability to cut costs and defer capital expenditures, (c) near-term liquidity, (d) available bank lines and (e) the timing of upcoming maturities to evaluate an issuer’s expected ability to manage through this period.

Our analysts have stress-tested every issuer and we thought it might be illustrative of the process to provide a couple of specific examples. Recall that during the initial phases of broad-based drawdowns of risk assets, there has often been a lack of differentiation when it comes to fundamentals, as risk assets have been sold indiscriminately.

For example, a major European telecommunications provider is not seeing declines in service and is, in fact, experiencing more stable volumes due to the critical nature of its services for those who need to work from home. Its bond and loan prices fell much further than we believe warranted by current and prospective fundamentals modeled in various scenarios. Our view is that the issuer has sufficient liquidity to manage through this challenging environment, as described in the following case study.

CASE STUDY

European Telecommunications Provider: Example of Issuer With Limited Direct Impact From COVID-19 Disruptions

OVERVIEW

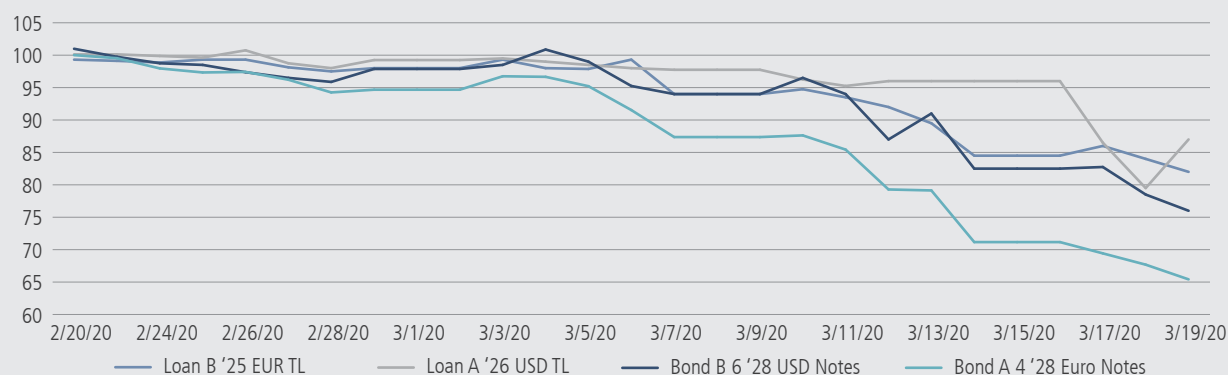
Company:

- European telecommunications company providing voice, video, data and Internet to consumers and businesses, serving more than 20 million customers.

Situation and market technicals:

- As a telecommunications provider, the company is experiencing limited direct impact from COVID-19; we believe it will be resilient in this environment, driven by the subscription-oriented nature of its services, and the importance of connectivity and communications to its customers.
- As a large and liquid high yield bond and loan issuer, this issuer has seen technical factors generate exaggerated impacts, in particular in Europe, where euro-denominated bonds have declined materially more than matched-duration U.S. dollar-denominated bonds.

FIGURE 6. EUROPEAN TELECOMMUNICATIONS PROVIDER: TERM LOAN AND BOND PRICES



Source: Bloomberg and Neuberger Berman. Data through March 19, 2020.

CREDIT METRICS/STRESS TEST PROCESS

Liquidity:

- The company has access to €1.9 billion revolver and €900 million in cash.
- It can defer its network upgrade and expansion for capex, reducing capital outflows during this period of macro turbulence.
- Telecom authorities have suspended indefinitely a 5G spectrum auction slated to begin in April, postponing the company's spending on acquiring and deploying spectrum.

Capital structure:

- The company has recently completed a terming out of its capital structure, with its next maturity not until 2025.

Demand through prior recessions:

- Other European telecoms saw revenue decline in the low- to mid-single-digit range through prior recessions.
- While the industry is more mature today, the nature of the services (in particular broadband and mobile) are more important to customers than in the past. A decline in consumer activity should also lower churn.

Stress test results:

- We anticipate the company's leverage increasing into the low- to mid-6x range in a downturn, with adequate liquidity to manage through the current environment.
- While a prolonged recession would clearly weigh more severely on the company, we view it as well positioned within the context of a virus-related macro slowdown.

The second example of our team's stress-testing is a global theme park operator whose bonds and loans sold off dramatically due to announced closure (see case study below). Our analyst covering this credit, along with portfolio managers and other analysts vetting the results, concluded that—even with a three- to six-month shutdown, assuming that most employees would be paid full salaries and that other variable operating costs can be reduced—the issuer would have sufficient total liquidity to get through three severe scenarios. While leverage would increase in the short run, our analyst's assessment is that it could return to normal after one to two years. Although there is no certainty as to how long the closures could be in place, looking to China and other areas, we can begin to see that businesses are beginning to reopen after a peak in the number of COVID-19 cases.

CASE STUDY

Global Theme Park Operator: Example of Issuer Directly Impacted by Virus-Related Closures

Our team has conducted scenario analyses based on (a) potential length of closings, (b) ability to cut costs and defer capex, (c) ability to access bank lines and (d) upcoming maturities to evaluate this issuer's expected ability to weather prolonged closures and other disruptions.

Currently, our analysis suggests that the company has a liquidity profile that can weather the current disruption based on the stated assumptions.

OVERVIEW

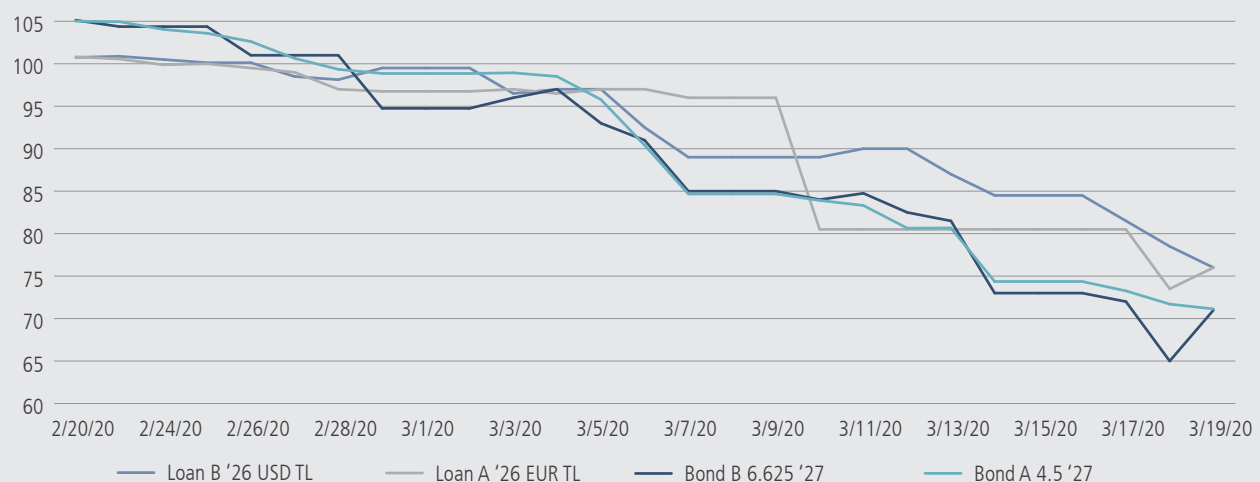
Company:

- The largest European and second-largest global operator of theme parks and attractions (by number of visitors), the company has over 120 attractions that are spread across more than 25 countries and attract more than 66 million visitors annually.

Situation and market technicals:

- The capital structure traded down as a result of announcements that several parks and attractions would be closed indefinitely on a global basis.
- 28% of volume relies on tourism (which may be more impacted); the remaining 72% is more resilient domestic business.

FIGURE 7. GLOBAL THEME PARK OPERATOR: TERM LOAN AND BOND PRICES



Source: Bloomberg and Neuberger Berman. Data through March 19, 2020.

CASE STUDY (continued)

CREDIT METRICS/STRESS TEST PROCESS

Formal stress-testing of current and prospective credit metrics assuming various downside/duration scenarios:

- The team analyzed the effect of prolonged closures on the credit. We assumed that most employees would continue to be paid full salaries, but that other operating expenses could be dramatically reduced.

Traffic declines (# of days), leverage and cash-flow liquidity under three scenarios:

| 90-day shutdown | 120-day shutdown | 180-day shutdown |
|--|---|---|
| Total liquidity: €507mm | Total liquidity: €413mm | Total liquidity: €368mm |
| Leverage: 9.0x (senior) 11.0x (total) | Leverage: 13.6x (senior) 16.8x (total) | Leverage: 18.0x (senior) 22.3x (total) |

- While leverage will likely rise above 10x temporarily, we believe debt should remain less than enterprise value and that leverage could return to normalized levels within one to two years.
- The company has no maturities over the next 6.5 years.

These are just two examples of the team's research and analytical efforts to avoid default risk and to quantify the scenarios that are being priced into individual credits' valuations. One of the key conclusions from our team's stress-testing exercise is that the median issuer within the non-investment grade market has an estimated eight months of liquidity available to manage through a period of potentially minimal revenues.

Opportunities, Outlook and Focus on the Longer Term

High yield spreads of around 1,000 basis points and loan prices in the 70s have historically provided some investors with good entry points for prospective return opportunities, even given the likelihood of higher expected default rates.

We will continue to monitor the impact of events on the real economy and the effectiveness of individual companies in managing through current and expected disruptions from the health crisis. While periods of increased macro uncertainty and heightened volatility typically have seen declines in the value of bonds and loans across all companies, we expect that the market will soon work to separate out winners and losers. In our view, this type of environment favors investment managers with global scale and the fundamental research resources to be on the leading edge of sorting through the market to find opportunities and avoid defaults. We are already seeing what we believe are attractive relative-value opportunities across ratings categories and sectors where we are selectively adding to issuers that we believe will be accretive to future returns.

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The ICE Bank of America U.S. High Yield Index tracks the performance of U.S. dollar-denominated below-investment-grade corporate debt publicly issued in the U.S. domestic market. Qualifying securities must have a below investment grade rating (based on an average of Moody's, S&P and Fitch), at least 18 months to final maturity at the time of issuance, at least one year remaining term to final maturity as of the rebalancing date, a fixed coupon schedule and a minimum amount outstanding of \$250 million.

The J.P. Morgan Domestic High Yield Index is designed to measure the investable universe of the U.S. dollar domestic high yield corporate debt market.

The S&P/LSTA Leveraged Loan Index is a daily total return index that uses LSTA/LPC mark-to-market pricing to calculate market value change. On a real-time basis, the S&P/LSTA Leveraged Loan Index tracks the current outstanding balance and spread over LIBOR for fully funded term loans. The facilities included in the index represent a broad cross section of leveraged loans syndicated in the United States, including dollar-denominated loans to overseas issuers.

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