Executive Summary

- In our view, there are five important benefits that investors seek from their US Treasury allocation: (i) income and returns, (ii) deflation hedging, (iii) diversification, (iv) duration hedging and (v) liquidity.

- In the current environment, for both tactical and strategic reasons, investors should consider shifting a portion of their Treasury allocation to US investment grade credit as we believe this sector is better positioned to deliver the benefits listed above.

- Treasury yields have come down significantly over the last 40 years, a fact that on its own requires asset managers to revisit their strategic allocations since the level of return provided by Treasurys is reduced.

- Going forward, inflation appears more of a threat than deflation due to the vaccine-enabled re-opening of economies, the Federal Reserve’s recent adoption of flexible average inflation targeting and the willingness of politicians to embrace large-scale stimulus to hasten the post-crisis recovery.

- From a tactical standpoint, therefore, the potentially higher returns from investment grade credit may outweigh the deflation-hedging benefits offered by Treasurys over the near term.

- In rising rate environments, the correlation between Treasurys and IG credit has historically increased, thus an investor may not be relinquishing significant diversification benefits by shifting into higher yielding corporate bonds.

- Even if an investor has a contrary view on the direction of rates, an asset owner seeking to mitigate duration risk should consider shifting into IG credit because the duration of credit has increased more than the duration of Treasurys since both spreads and bond yields have dropped in recent periods.

Please see end of paper for important disclaimers.
**Introduction**

US Treasurys have traditionally played an outsized role in the portfolios of many institutional investors. When we look back over the last 3-year and 20-year periods, these investments have delivered meaningful returns relative to other yield-generating asset classes on a risk-adjusted basis.

In our view, there are five important benefits that investors seek from their US Treasury allocation: (i) income and returns, (ii) deflation hedging, (iii) diversification, (iv) duration hedging and (v) liquidity. We believe that both the current low-yield environment and the likely impact on inflation and rates of the momentous events unfolding across the economic, financial and political landscape are weakening the pillars that support the case for US Treasurys. For both tactical and strategic reasons, therefore, we believe that the time is ripe for investors to consider substitutes that may be better equipped to deliver the benefits that investors seek from these instruments.

The COVID-19 shock, unsurprisingly, is the key influencer of our tactical view on US Treasurys. In addition to the devastating impact that the virus continues to have on the lives and wellbeing of millions around the globe, we expect that it will have a transformative effect on fiscal and monetary policy, international trade and corporate behavior. So much so that we believe it will draw the curtain on the low-rate, low-inflation regime that has prevailed since the onset of the Global Financial Crisis (GFC). As inflation risk rises and deflation risk falls, the benefit of shifting into higher-yielding asset classes such as investment grade corporate credit (IG credit) may outweigh the need to maintain the same level of deflation protection.

From a strategic perspective, even if one has no view on the direction of rates and inflation, we believe there is more benefit to be gained from holding fewer Treasurys in the present low-yield environment given the modest level of returns, and less efficient diversification and duration-hedging benefits than investment-grade corporate credit.

In this paper we will examine the strength of each of the pillars that support the investment rationale for US Treasurys in light of current events and present our case for why we believe that IG credit can serve as an attractive substitute.

### I. Return and Income

On a risk-adjusted basis, over the recent three- and 20-year periods, Treasurys have provided comparable returns relative to other asset classes as shown in Display 1.

As Display 2 indicates, major institutional investors, including some of the largest US educational endowments, are significantly overweight US Treasurys within their fixed income allocation relative to the Bloomberg Barclays US Aggregate Index.

As is commonly known, current US Treasury yields are significantly lower than longer-term averages as shown in Display 3. This is a problem for many pension funds with return targets in the 7% range and endowments with real return targets of CPI + 5%. With yields at such low levels, it is highly unlikely, if not impossible, for US Treasurys to provide much help to these investors as they seek to achieve their investment objectives.

From a return standpoint, US Treasurys appear poised to disappoint. The enormous response to the crisis on the part of the Federal Reserve and the US government has driven fiscal deficits to levels not seen since the height of World War II.
DISPLAY 2
Major educational endowments have outsized positions in US Treasurys within their fixed income allocations

Bloomberg Barclays US Aggregate Index (as of March 31, 2021)

Select Endowment Asset Allocations (% of Fixed Income Allocation Devoted to Treasurys)

- Stanford: 100.0%
- U Penn: 93.5%
- MIT: 68.1%
- Cornell: 42.1%

Source: Bloomberg, Endowment Annual Reports 2020

DISPLAY 3
Current US Treasury Yields are well below long-run averages

US Treasury Yields (as of March 31, 2021)

Source: Analysis performed by MSIM, Bloomberg. Past performance is not indicative of future returns.

DISPLAY 4
Low-yielding US Treasurys threaten the ability of CalPERS and the Yale to achieve their return targets

Expected and Realized Treasury Performance (December 31, 1979 through March 31, 2021)

- 7% Return: CalPERS ACTUARIAL TARGET
- CPI + 5.25%: YALE RETURN TARGET

Source: Analysis performed by MSIM, Bloomberg, Annual Reports of CalPERS and Yale Endowment. Past performance is not indicative of future returns.

¹ Treasury performance is measured by Bloomberg Barclays US Treasury Index.
War II as illustrated in Display 5A. In addition, as shown in Display 5B, public debt has risen to approximately 140% of GDP from 60% of GDP just twenty years ago. To find buyers for new issuance, yields will likely rise. In the current low rate environment, as Display 6 indicates, a 39bps move in yields would completely eliminate the income from intermediate-term US Treasurys within a year. The marginally higher yields offered by IG credit, due to the spread over US Treasurys, may mitigate to some extent the impact on returns of rising rates.

**II. Deflation Hedging**

There are several reasons to believe that the post-GFC low-inflation, low-rate regime is drawing to a close. The vaccine-enabled reopening of economies, the unleashing of pent-up consumer demand and pressure on supply-chains to respond quickly may drive prices higher.

**DISPLAY 5A**
The US Fiscal Deficit is approaching historic heights
US Fiscal Deficit (% of GDP)

**DISPLAY 5B**
Public debt has more than doubled over the last two decades
Public Debt (% of GDP)

**DISPLAY 6**
Income from intermediate US Treasury bonds would disappear in a year if rates move slightly higher

<table>
<thead>
<tr>
<th>Current Fixed Income Characteristics (As of March 31, 2021)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yield (%)</strong></td>
</tr>
<tr>
<td>1.00</td>
</tr>
<tr>
<td>2.28</td>
</tr>
</tbody>
</table>

Source: Analysis performed by MSIM, Bloomberg. *Past performance is not indicative of future returns.* Yield volatility is based on past 36 months as of March 31, 2021.
The Federal Reserve’s shift to flexible average inflation targeting indicates its willingness to tolerate a level of inflation above the long-term average to encourage continued economic growth. From a fiscal standpoint, the $1.9 billion American Rescue Plan should serve as a near-term source of demand. Additional factors, among others, that may lead to inflationary pressures include the in-sourcing of critical manufacturing components to higher-wage domestic markets to protect fragile supply chains from future economic shocks and China’s continuing efforts to develop domestic demand. Thus, as deflation risk recedes and inflation risk advances, the benefit of holding US Treasurys as a hedge against falling prices is significantly diminished and higher-yielding fixed-income sectors like IG credit appear more attractive.
III: Diversification
Retrospectively, one of the strongest arguments in favor of investing in US Treasurys are their potential diversification benefits relative to equities. As illustrated in Display 8, over the five most recent periods of market stress, US Treasurys have admirably performed their diversification function. It is important to note, however, that US Treasurys do not always act as diversifiers in crisis periods. There are times when both US Treasurys and equities decline.

DISPLAY 8
Treasurys have significantly outperformed equities during recent periods of market stress
Cumulative Returns During Stress Periods

<table>
<thead>
<tr>
<th>Period</th>
<th>Equity</th>
<th>Treasury</th>
<th>IG Corp</th>
<th>Gold</th>
<th>MBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dot-com Bubble</td>
<td>30.5%</td>
<td>30.6%</td>
<td>13.1%</td>
<td>29.0%</td>
<td>21.1%</td>
</tr>
<tr>
<td>Financial Crisis</td>
<td>-3.2%</td>
<td>-12.4%</td>
<td>-2.1%</td>
<td>4.6%</td>
<td>0.3%</td>
</tr>
<tr>
<td>U.S. Downgrade</td>
<td>-14.0%</td>
<td>-5.5%</td>
<td>1.4%</td>
<td>-2.6%</td>
<td>2.6%</td>
</tr>
<tr>
<td>2018 Stock Crash</td>
<td>-20.0%</td>
<td>-3.6%</td>
<td>2.1%</td>
<td>6.6%</td>
<td>8.2%</td>
</tr>
<tr>
<td>COVID-19</td>
<td>4.2%</td>
<td>2.8%</td>
<td>4.6%</td>
<td>33.6%</td>
<td>17.1%</td>
</tr>
</tbody>
</table>

Source: As of 2021. Analysis performed by MSIM, Bloomberg. Past performance is not indicative of future returns. Asset classes proxied by: S&P 500 Index (Equity); Barclays US Agg Ttl Tsy Value Unhedged (Tsy); Barclays US MBS Index TR Value Unhedged (MBS); LBMA Gold Price PM USD (Gold); Barclays US Corp TR Value Unhedged (IG Corp).

DISPLAY 9
Equities and Treasurys are positively correlated in certain periods

<table>
<thead>
<tr>
<th>Period</th>
<th>Equity</th>
<th>Treasury</th>
<th>IG Corp</th>
<th>Gold</th>
<th>MBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2009</td>
<td>4%</td>
<td>8%</td>
<td>4%</td>
<td>-1.4%</td>
<td>-2.6%</td>
</tr>
<tr>
<td>Q3 1981</td>
<td>4%</td>
<td>8%</td>
<td>-2.6%</td>
<td>-0.5%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Q1 1994</td>
<td>4%</td>
<td>8%</td>
<td>-2.6%</td>
<td>-0.5%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Q1 1990</td>
<td>4%</td>
<td>8%</td>
<td>-2.6%</td>
<td>-0.5%</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

Source: Analysis performed by MSIM, Bloomberg. Past performance is not indicative of future returns. Asset classes proxied by: S&P 500 Index (Equity); Barclays US Agg Ttl Tsy Value Unhedged (Tsy); Barclays US MBS Index TR Value Unhedged (MBS); LBMA Gold Price PM USD (Gold); Barclays US Corp TR Value Unhedged (IG Corp).
in tandem as seen in Display 9. Such periods typically occur under the following circumstances: low-yield environments, inflation shocks, when investors rush towards liquidity and supply/demand imbalances. Therefore, if upside inflation surprises are deemed more likely in the near and intermediate term, US Treasurys may not offer the same degree of protection against falling stock prices as in the past.

It is instructive at this point to compare the performance of IG credit and US Treasurys during rising rate environments. Interestingly, the correlation between the two types of bonds increases when rates rise as shown in Display 10. Assuming that this relationship holds true in the future, by investing in IG credit one can achieve a similar level of diversification relative to equities while capturing incremental yield.

### IV: Duration Hedging

For many institutional investors, US Treasurys have traditionally served as a key component of duration management strategies. By definition, duration is calculated based on the amount and timing of future cash flows and prevailing yield levels. As a result, yield movements would impact duration in certain ways. There are three observations that we believe have important portfolio implications: (i) The duration of a bond with a particular maturity increases as yields drop, (ii) as a corollary, as yields drop duration converges to maturity, and (iii) the duration of credit will be a function of both the yield curve and spread, so when both drop, credit durations will increase faster than Treasury duration.

The derivation of these relationships may be found in the appendix. This relationship is demonstrated empirically in Display 11. The duration of a US 10-Year Government Bond has increased as the yield has declined over the past 20 years.
For IG bonds, the yields can be separated into two components: government bond yields and the credit spread. As seen in Display 12, over the last 10 years when both rates and spreads fell, the duration of Intermediate IG corporate bonds increased more than the duration of Intermediate Treasurys (partially due to spread compression).

In Display 13 we seek to demonstrate how such a change in duration may impact allocation decisions. We start with a hypothetical 60/40 equity and fixed income portfolio, where the fixed income allocation is split evenly between long-term Treasurys (“LT Treasurys”) and long-term corporate bonds (“LT Corporates”).

For this exercise we assume that this is the optimal asset portfolio. Then we derive the implied return based on our volatility and covariance assumptions.

Historically, this portfolio had a duration ratio (duration of LDI portfolio/duration of liabilities) of 1.15 when the yield of LT Corporates was around 5% and the LT Treasury yield was around 2.9%. As of December 2020, the yield of LT Corporates and LT Treasurys has fallen to 2.8% and 1.5% respectively. As a consequence, the duration of LT Corporates has increased from 13.9 to 15.2 and the duration of LT Treasurys has increased from 18.5 to 19.4.

We re-ran our optimization to see how the asset allocation would change if we wanted to maintain a constant duration ratio of 1.15. We chose to use the duration ratio as the constraint to eliminate the impact of the portfolio’s funded status and equity allocation in our analysis. In the table below we examine the scenario described above and also a few cases of a hypothetical duration increase of 1 year. An increase in the duration of LT Treasurys, LT Corporates, or both, will result in a higher allocation to corporate bonds. On average, the allocation to LT Corporates increases around 10% when both LT Corporate and LT Treasury duration increased by 1 year. This is because as the duration of the fixed income assets increases, in order to maintain the 1.15 duration ratio, investors have more flexibility to allocate to more efficient assets with shorter duration.

The implication of this analysis is that an asset owner with a specific mix of credit, equity and Treasurys based on the risk, return and duration of those assets in a higher yielding environment will choose a different mix as yields drop. Specifically, in an environment where spreads and bond yields are simultaneously dropping, even without taking any view on the direction of rates, the same asset owner will choose to reduce Treasurys and increase credit because the relative duration of credit has increased versus Treasurys.

V. Liquidity

Treasurys clearly are, and will ever remain, the most liquid financial instruments. The

### Display 12

The duration of IG Corporate Bonds increased more than the duration of Treasurys when both yields and rate fell

<table>
<thead>
<tr>
<th>Intermediate US Treasury Characteristics</th>
<th>Intermediate IG Corporate Bond Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Current and 10 years ago, as of March 31, 2021)</td>
<td>(Current and 10 years ago, as of March 31, 2021)</td>
</tr>
<tr>
<td>Yield (%)</td>
<td>Duration</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>2.06</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: Analysis performed by MSIM, Bloomberg. Past performance is not indicative of future returns.

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2 These percentage allocations are only for illustrative purposes and do not constitute, and should not be construed as, investment advice or recommendations with respect to the securities or investments mentioned.

3 It is worth noting that this analysis is for a traditional asset allocation exercise, i.e., an asset-only optimization. If one considers an asset-liability context, because the duration of liabilities may also be changing the conclusions may be changed in either direction or magnitude, depending on the nature of the liabilities with respect to the assets. Although this is beyond the scope of the current paper we encourage readers to consider the specific context of their liabilities as they apply the findings of this study.
monthly traded volume of US Treasurys stood at $26 trillion in 2020. For investors who prize this factor above all, there is no substitute for government bonds. For those that don’t, the question is whether there are other investments that offer sufficient return to compensate for slightly less liquidity. We believe that this is the case and again point to IG credit as a good substitute for Treasurys.

### Summary
When examining each of the pillars that underlie the investment case for Treasurys—(i) yield and return, (ii) deflation protection, (iii) diversification, (iv) duration hedging and (v) liquidity—we believe that there are both strategic and tactical reasons why investors should consider moving into substitutes such as IG credit. In a near-term environment of higher yields and higher inflation driven by fiscal and policy actions, the inflation-hedging benefit of holding Treasurys is diminished and capturing additional return from the IG credit spread appears more desirable. Even if an investor has no view on the direction of rates and inflation, from a strategic standpoint, IG credit appears to be a more efficient source of return, duration and diversification than comparable Treasurys.

### DISPLAY 13
Impact of Change in Duration on Asset Allocation

#### Duration Assumptions

<table>
<thead>
<tr>
<th></th>
<th>BASE CASE</th>
<th>DUR OF TSY INCREASES BY 1 YR</th>
<th>DUR OF CORP INCREASES BY 1 YR</th>
<th>DUR OF BOTH INCREASES BY 1 YEAR</th>
<th>WHEN YIELD AND SPREAD BOTH DROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT Corporate Bond</td>
<td>13.85</td>
<td>13.85</td>
<td>14.85</td>
<td>14.85</td>
<td>15.18</td>
</tr>
</tbody>
</table>

#### Allocation

<table>
<thead>
<tr>
<th></th>
<th>BASE CASE</th>
<th>DUR OF TSY INCREASES BY 1 YR</th>
<th>DUR OF CORP INCREASES BY 1 YR</th>
<th>DUR OF BOTH INCREASES BY 1 YEAR</th>
<th>WHEN YIELD AND SPREAD BOTH DROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT Corporate Bond</td>
<td>20.0%</td>
<td>24.1%</td>
<td>26.4%</td>
<td>30.1%</td>
<td>32.6%</td>
</tr>
<tr>
<td>LT Treasury</td>
<td>20.0%</td>
<td>16.8%</td>
<td>15.0%</td>
<td>11.9%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Passive Public Equities</td>
<td>60.0%</td>
<td>59.1%</td>
<td>58.7%</td>
<td>57.9%</td>
<td>57.5%</td>
</tr>
</tbody>
</table>

Source: Morgan Stanley Investment Management Portfolio Solutions Group analysis. For illustrative purposes only.
### ASSET CHARACTERISTICS

<table>
<thead>
<tr>
<th></th>
<th>LIQUIDITY</th>
<th>RETURN AND/OR INCOME</th>
<th>INFLATION HEDGING</th>
<th>DIVERSIFICATION VS. EQUITY</th>
<th>DURATION MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TREASURYS</td>
<td>✓✓✓</td>
<td>✕✗</td>
<td>✕✗</td>
<td>✓✓</td>
<td>✓✓</td>
</tr>
<tr>
<td>IG CORPORATE</td>
<td>✓</td>
<td>✓</td>
<td>=</td>
<td>✓</td>
<td>✓✓</td>
</tr>
<tr>
<td>MBS</td>
<td>✓✓</td>
<td>✓</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>GOLD</td>
<td>✓✓</td>
<td>✓</td>
<td>=</td>
<td>✓</td>
<td>=</td>
</tr>
<tr>
<td>TIPS</td>
<td>✓✓</td>
<td>=</td>
<td>✓✓</td>
<td>✓</td>
<td>✓✓</td>
</tr>
</tbody>
</table>

For illustrative purposes
Appendix

I. DURATION INCREASES AS YIELDS DROP

Macaulay duration can be defined as

\[ D = \frac{\sum_{i=1}^{n} t_i \cdot PV_i}{V} = \frac{\sum_{i=1}^{n} t_i \cdot CF_i \cdot e^{-y t_i}}{V} = \frac{g(y)}{V(y)} \]

\[ V = \sum_{i=1}^{n} PV_i = \sum_{i=1}^{n} CF_i \cdot e^{-y t_i} \]

Where,

- \( D \) is Macaulay duration,
- \( i \) indexes the cash payments
- \( t_i \) is the time in years until the \( i \)th cash payment will be received
- \( PV_i \) is the present value of the \( i \)th cash payment from the asset
- \( V \) is the present value of all future cash payments from the asset
- \( CF_i \) is the cash flow from the \( i \)th cash payment from an asset
- \( y \) is the yield to maturity (continuously compounded)

The derivative of duration with respect to yield is

\[ \frac{\partial D}{\partial y} = \frac{\partial g(y)}{\partial y} \cdot \frac{V(y) - g(y) \cdot \frac{\partial V(y)}{\partial y}}{V(y)^2} \]

\[ = \left( \sum_{i=1}^{n} t_i^2 \cdot CF_i \cdot e^{-y t_i} \right) \cdot \frac{V(y) - g(y) \cdot \left( \sum_{i=1}^{n} t_i \cdot CF_i \cdot e^{-y t_i} \right)}{V(y)^2} \]

\[ = \left( \frac{\left( \sum_{i=1}^{n} t_i^2 \cdot CF_i \cdot e^{-y t_i} \right) \cdot V(y) - g(y) \left( \sum_{i=1}^{n} t_i \cdot CF_i \cdot e^{-y t_i} \right)}{V(y)^2} \right) \cdot \frac{V(y) - g(y) \cdot \left( \sum_{i=1}^{n} t_i \cdot CF_i \cdot e^{-y t_i} \right)}{V(y)^2} - D^2 \]

If we write

\[ \omega_i = \frac{CF_i \cdot e^{-y t_i}}{V(y)} \]

So that

\[ \sum_{i=1}^{n} \omega_i = 1 \text{ and } D = \sum_{i=1}^{n} t_i \omega_i \]

Then

\[ \frac{\partial D}{\partial y} = - \left( \sum_{i=1}^{n} t_i^2 \cdot \omega_i - D^2 \right) = - \sum_{i=1}^{n} \omega_i \cdot (t_i - D)^2 \]

which is always negative. Hence, as yields drop, duration increases.

II. DURATION MOVES CLOSER TO MATURITY AS YIELDS DROP

We can rewrite duration as

\[ D = \frac{\sum_{i=1}^{n} t_i \cdot PV_i}{V} = \frac{\sum_{i=1}^{n} t_i \cdot CF_i \cdot e^{-y t_i}}{V} = \sum_{i=1}^{n} t_i \omega_i \]

Where,

- \( \omega_i = \frac{CF_i \cdot e^{-y t_i}}{V(y)} \)

As yields drop, weights shift more to the longer term as the discount factors \( e^{-y t_i} \) increase more for longer term payments. Hence, \( D \) will be closer to \( t_n \), which is the maturity.

III. DURATION WILL INCREASE FASTER FOR CREDIT IF BOTH YIELDS AND SPREADS DECLINE

Change in duration with respect to yield can be written as

\[ \Delta D = \frac{\partial D}{\partial y} \cdot \Delta y \]

Where,

- \( D \) is Macaulay duration,
- \( \Delta D \) is the change in duration,
- \( \Delta y \) is the change in yield

If we write

\[ \Delta y = \Delta r \text{ and } \Delta y_{IG} = \Delta r + \Delta c \]

Where,

- \( y_{ts} \) is the yield for a treasury,
- \( y_{IG} \) is the yield for an IG bond,
- \( r \) is the government bond yield,
- \( c \) is the spread for an IG bond

Then,

\[ \Delta D_{ts} = \frac{\partial D_{ts}}{\partial y} \cdot \Delta r \text{ and } \Delta D_{IG} = \frac{\partial D_{IG}}{\partial y} \cdot (\Delta r + \Delta c) \]

In i, we have shown that \( \frac{\partial D_{ts}}{\partial y} \) is a function of yield and cash flow amounts/timing. Hence, \( \frac{\partial D_{ts}}{\partial y} \) and \( \frac{\partial D_{IG}}{\partial y} \) will be similar for both bonds if they have similar yield levels and cash flow profiles. Then when government bond yields(\( r \)) and spreads(\( c \)) fall, the change in duration will be larger for an IG bond than a treasury.
DEFINITIONS

The S&P 500® Index measures the performance of the large cap segment of the US equities market, covering approximately 75% of the US equities market. The Index includes 500 leading companies in leading industries of the US economy.

The Bloomberg Barclays US Treasury Bond Index includes public obligations of the US Treasury, i.e., US government bonds.

The Bloomberg Barclays US Mortgage Backed Securities (MBS) Index tracks fixed-rate agency mortgage backed passsthrough securities guaranteed by Ginnie Mae (GNMA), Fannie Mae (FNMA), and Freddie Mac (FHLMC).

The Bloomberg Barclays US Corporate Index is a broad-based benchmark that measures the investment grade, fixed-rate, taxable, corporate bond market.

The Bloomberg Barclays US Corporate High Yield Index measures the market of USD-denominated, non-investment grade, fixed-rate, taxable corporate bonds. Securities are classified as high yield if the middle rating of Moody's, Fitch, and S&P is Ba1/B+/BB+ or below. The Index excludes emerging market debt.

The MSCI US REIT Index is a free float-adjusted market capitalization weighted index that is comprised of equity REITs that are included in the MSCI US Investable Market 2500 Index, with the exception of specialty equity REITs that do not generate a majority of their revenue and income from real estate rental and leasing operations. The index represents approximately 85% of the US REIT universe.

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The ongoing spread of the Coronavirus has had, and will continue to have, a material adverse impact on local economies in the affected jurisdictions and also on the global economy, as cross border commercial activity and market sentiment are increasingly impacted by the outbreak and government and other measures seeking to contain its spread. The global impact of the outbreak has been rapidly evolving, and many countries have reacted by instituting quarantines and restrictions on travel. These actions are creating disruption in supply chains, and adversely impacting a number of industries, including but not limited to retail, transportation, hospitality, and entertainment. In addition to these developments having adverse consequences for certain portfolio companies and other issuers, our operations have been, and could continue to be, adversely impacted, including through quarantine measures and travel restrictions imposed on our personnel or service providers based or temporarily located in affected countries, or any related health issues of such personnel or service providers. Any of the foregoing events could materially and adversely
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