

Liability-Driven Investing and Climate Risk: Facing Reality One Step at a Time

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One of the main goals of pension plan sponsors who use LDI is to minimize unrewarded risks. In addition to traditional unrewarded risks, such as currency, interest rate, inflation and reinvestment risks, a risk that is becoming increasingly important is climate risk. Therefore, the first step in preparing to face climate risk is to understand it to be able to assess its impact. The good news is that we're now able to obtain a wide range of data related to climate risk that is relatively accurate and reliable for the majority of bond issuers.

In liability-driven investing (LDI), in addition to unrewarded risks, default risk and migration risk are the most significant. One of the main goals of an LDI strategy is to ensure that expected cash flows are received in order to meet the pension plan's liabilities or, in other words, minimize default risk. Migration risk arises when a company's credit rating falls below BBB, thereby becoming a high-yield issuer. By exiting the investment-grade universe, the impact on the performance of an LDI strategy is significant, since the manager would, in many cases, be forced to sell the company's bonds under conditions that aren't necessarily favorable.

Maintaining a good credit rating is therefore crucial, and while factors such as having a healthy balance sheet and profit margins remain fundamental to issuers' credit analysis, the impact of climate change now adds a new dimension to migration risk.

Understanding Climate Risk

Climate risk comes in three forms for companies:

<p>Physical</p>	<p>Physical risks refer to the financial risks from the increasing severity and frequency of extreme climate change-related weather events (i.e., acute physical risks); longer-term gradual shifts of the climate (i.e., chronic physical risks); and indirect effects of climate change such as public health implications (e.g., morbidity and mortality impacts).</p>
<p>Transition</p>	<p>Transition risks refer to the financial risks related to the process of adjustment towards a low-greenhouse gas (GHG) economy. These risks can emerge from current or future government policies, legislation, and regulation to limit GHG emissions, as well as changes in market and customer sentiment toward a low-GHG economy.</p>
<p>Technological opportunities</p>	<p>The transition to a low-carbon economy can present unexploited growth potential for companies. For example, companies could enjoy additional income if they invested in clean technologies (e.g., electric vehicle batteries) or will be in a position to take advantage of opportunities if they have patents related to clean technologies. Technological opportunities can therefore lead to a positive contribution to business valuation and reduce climate risk.</p>

Source: Manulife Investment Management, Office of the Superintendent of Financial Institutions

Climate risk is systemic (i.e., undiversifiable), and will impact nearly every company around the world; however, the magnitude of the impact of these types of risk/opportunity will depend on how we approach climate change as a society. For instance, the impact of the transition factor will be higher in a scenario where we succeed in limiting the temperature increase to only 1.5°C by 2050, as this will mean that significantly stricter regulations will have been put in place to achieve this.

In our view, the most likely scenario is one of those provided by the [Network for Greening the Financial System](#), which assumes that global temperatures will increase by 2°C by 2050 and that the transition will be disorderly across sectors and regions. In this scenario, our society is somewhat slow to act and therefore has to accelerate later to rectify the situation—a reactive rather than preventive approach. This scenario suggests that the transition component will have a relatively high, but longer-term impact, meaning that companies have somewhat of a grace period before more drastic policies are implemented.

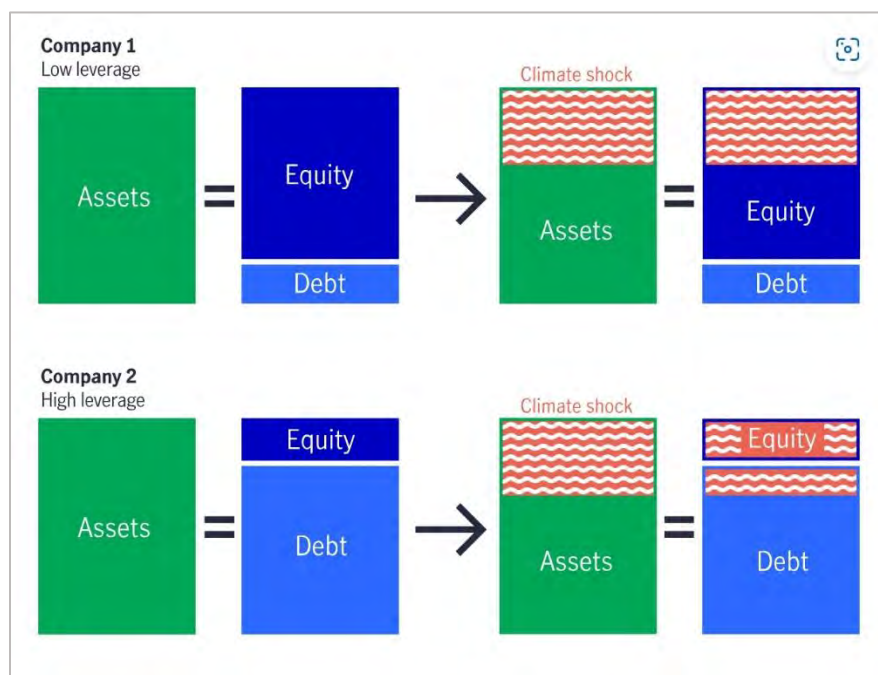
In an LDI context, another important factor to consider is the capital structure. Since LDI strategies mostly invest in bonds, which have a higher priority in the capital structure than equities, the climate shock is milder. The impact of a new policy or climate event is initially absorbed by a decrease in equity value, and depending on its financial strength, its bonds and credit rating could remain intact, as illustrated for Company 1 in the chart below.

Furthermore, in the event of bankruptcy, bondholders have some protection, as they're among the first investors to be reimbursed from the disposition of assets. The average recovery rate frequently cited in the industry is 40% in

the event of bankruptcy; loss of value of a bond should therefore be between 0% and 60%.

Figure 1

A COMPANY WITH A STRONG BALANCE SHEET CAN BETTER ABSORB A CLIMATE SHOCK



Source: Manulife Investment Management, MSCI, 2022. For illustrative purposes only.

Measuring Climate Risk

Several providers of climate risk data and measures are currently available on the market. We've considered and analyzed several of them up to this point. This includes the raw data associated with GHG emissions, whether in absolute or intensity terms, which can be broken down based on the value chain, [from upstream direct emissions in scope 1 to indirect downstream emissions in scope 3 and energy consumption emissions in scope 2](#). One of the limits of this data, which is nevertheless tangible, is the fact that it's historical and doesn't make it possible to see how a company manages its climate risk, which could have an impact on its future valuation and consequently on an LDI strategy. Also, this type of data doesn't necessarily capture all forms of climate risk such as technological opportunities.

For these reasons, we've chosen to work with a forward-looking measure that considers the three previously described forms of climate risk and is in line with the recommendations of the [Task Force on Climate-related Financial Disclosures](#) for performing scenario analysis in investment portfolios. The climate value-at-risk (Climate VaR) metric provided by MSCI aims to measure, in percentage, the potential negative impact of the effects of climate change on the valuation of issuers (at the company or share level) or individual holdings (at the security level) based on different scenarios.

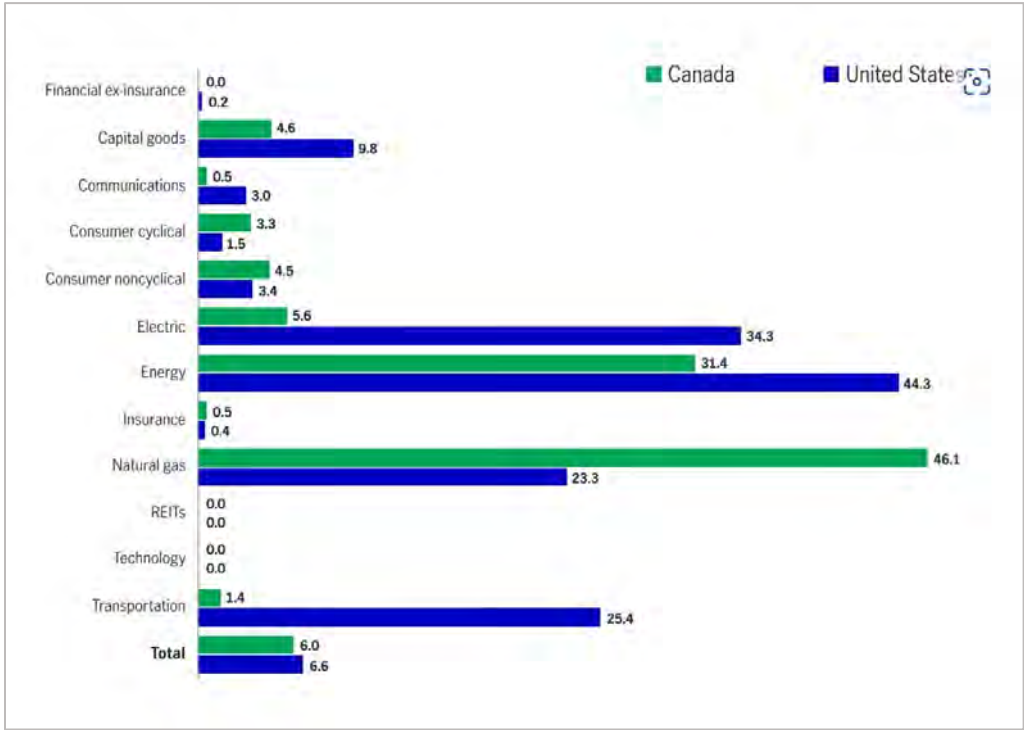
As of November 30, 2022, the Climate VaR methodology coverage of corporate issuers was 92% in the United States based on the Bloomberg U.S. Corporate Bond Index. In comparison, this figure is 73% for Canada based on the FTSE

Canada Universe Index. This data is also available at the security level for most bonds, providing additional granularity as they take into account their maturity. Climate VaR is calculated using raw, quantifiable underlying data, such as GHG emissions, and uses a rigorous methodology, providing investors with relatively accurate and reliable data. It’s worth noting that we’re continuing to analyze and validate with our sustainable investment team the change in different methodologies from different data providers. Even though this data is separated into the three types of climate risk (physical and transition risks, and technological opportunities), the physical risk factor gives results that are too limited to be included in our analyses at this time. Within our first case studies for integrating Climate VaR, the following conditions are therefore based only on transition and technological opportunities factors.

Conclusion 1: U.S. Bond Markets Display Lower Long-Term Climate VaR than Canada

We assessed the two biggest bond markets in North America—the U.S. and Canada—to compare the level of Climate VaR that an LDI mandate would likely encounter. **At first glance, the Canadian corporate bond market is less exposed to climate risk with a total Climate VaR at 6.0% compared to the U.S. at 6.6%¹.** In addition, Canada has only two sectors that could be considered high risk while the United States has four.

Figure 2
BOND CLIMATE VAR, WEIGHTED AVERAGE, BY SECTOR AND IN TOTAL (%)



Source: Manulife Investment Management, MSCI, as of November 30, 2022

¹ That means a decrease in value of 6.0% in a portfolio containing Canadian investment-grade bonds versus a loss of 6.6% in a U.S. bond portfolio.

Despite this, managing corporate bond climate risk is more complex in Canada than in the U.S. This is because more than 35% of Canadian corporate bonds are short-term bonds from the financial ex-insurance sector, which significantly reduces the total Climate VaR of the Canadian market (since these short-term bonds have virtually zero exposure to climate risk). LDI mandates invest primarily in mid- to long-term bonds to match the duration of liabilities, which is typically between 12 and 25 years. Therefore, they can't use many of these bonds to reduce climate risk as much as a traditional corporate bond strategy could.

A look at the longer-term segments, which better represent the investments of an LDI mandate, shows that the U.S. market is actually **less** exposed to climate risk than the Canadian market, due to the latter's higher proportion of long-term bonds from oil and pipeline companies.

Table 1
CLIMATE VAR FOR LONGER-TERM CORPORATE BONDS IN AN LDI CONTEXT (%)

	Midterm	Long term
United States	5.7	8.8
Canada	8.4	11.7

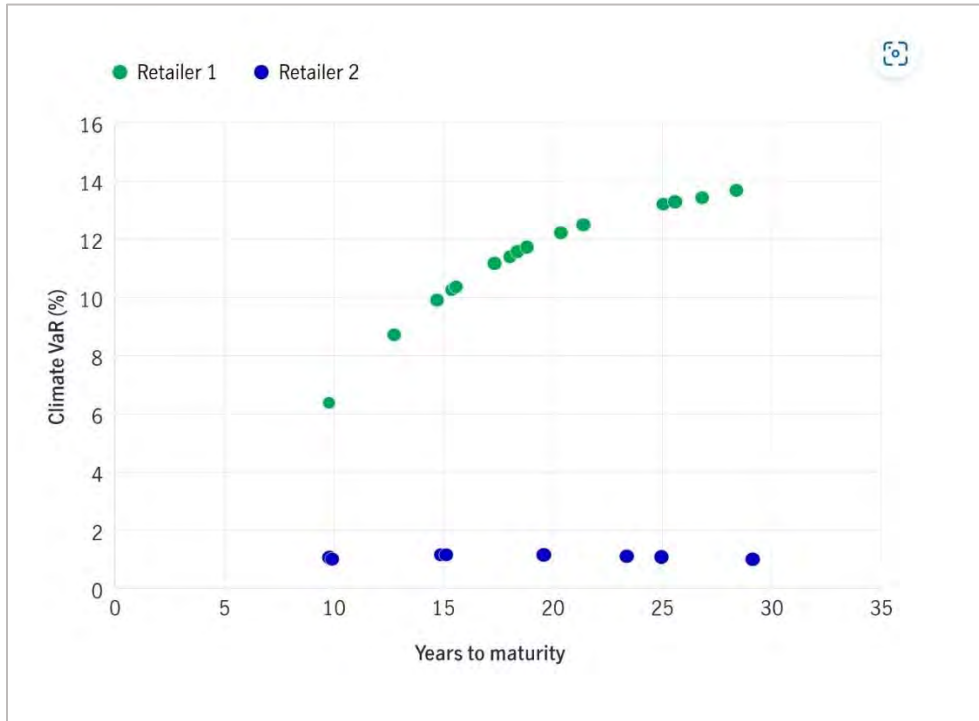
Source: Manulife Investment Management, MSCI, as of November 30, 2022.

While there are other factors to consider, such as basis risk and meeting investment objectives, we believe the U.S. bond market is a good option for diversifying the climate risk exposure of LDI mandates.

Conclusion 2: Security Selection Has More Impact than Curve Positioning

Naturally, there is a direct relationship between the term of a bond and its exposure to climate risk (all else equal, the longer the term, the higher the Climate VaR). However, we would have expected the difference to be more pronounced, especially in a scenario where the temperature increase is limited to 2°C. For instance, the difference between two bonds from the same U.S. retailer—one of which matures in 20 years and the other in 29 years—is only 2%. Meanwhile, the difference in the Climate VaR between this same 29-year bond and a bond of a similar retailer with the same term is 13%.

Figure 3
EXAMPLES OF THE DISTRIBUTION OF CLIMATE VaR FOR MEDIUM/LONG-TERM BONDS FROM TWO MAJOR U.S. RETAILERS



Source: Manulife Investment Management, MSCI, as of November 30, 2022

These results indicate that, in order to mitigate climate risk, selecting companies with better environmental practices is more effective than investing in a bond of the same company, but with a shorter maturity. When carefully executed, security selection and sector allocation can reduce climate risk without affecting interest-rate sensitivity, unlike a shift in curve positioning.

Conclusion 3: Climate VaR Data Leaves Room for Judgement

It's worth noting that the Climate VaR data is based solely on the quantitative data available at a specific point in time and doesn't take into account the potential and commitment of an issuer to improve its environmental practices. In our view, two identical Climate VaR numbers aren't necessarily equal, and they necessitate human judgment. Fundamental research and commitment from issuers will always be a necessary addition to any quantitative approach to nuance some results. For instance, the following two issuers each have a Climate VaR of 60% (the worst possible Climate VaR), but when we look at the investments made by both companies in recent years and their climate plans, it becomes clear to us that Company A's climate risk is lower than Company B's.

<p>Company A Climate VaR: 60%</p>	<p>This company generates electricity primarily from coal and natural gas and, for this reason, has a high Climate VaR.</p> <p>However, since 2009, the company has begun to invest billions of dollars in renewable energy and plans to continue to diversify and expand its capacity to produce greener energy, which is encouraging from a climate risk perspective.</p>
<p>Company B Climate VaR: 60%</p>	<p>This company is an oil producer and, like most of its peers, has a very high Climate VaR.</p> <p>The company’s strategy to reduce its environmental footprint relies almost entirely on building carbon sequestration facilities, the effectiveness of which have yet to be proven. This is good from an environmental standpoint, but in terms of climate risk, it’s less certain.</p> <p>Its capital expenditure continues to be primarily dedicated to its oil projects and the company remains highly exposed to any potential regulations targeting this sector. Unfortunately, there is no indication that its climate risk will diminish in the near future, and this is the type of issuer we’re trying to avoid when managing climate risk, especially in a context where this company contributes more to scope 3 GHG emissions through its users.</p>

For illustrative purposes only

The contribution of human intervention in the decision-making process of an LDI strategy shouldn’t be underestimated. The ability to distinguish between the different nuances present in the data (Company A versus Company B, for instance) is crucial to properly manage climate risk.

The Next Steps

As demonstrated above, we believe climate risk is now an integral source of migration risk, and while the use of Climate VaR data provides a good starting point to better identify and manage this climate risk, our work doesn't stop there.

Active ownership	As a steward of capital, we have a duty to positively influence and guide corporate environmental practices to achieve a more sustainable future. We believe that solely excluding any issuer with a high Climate VaR lacks perspective and could, potentially, be detrimental to achieving investment objectives. We prefer to use our position of proximity to company management to engage with these companies and find solutions together so that, ultimately, climate risk can progressively diminish over time.
Collaboration with data providers	Collaboration between data providers and asset managers is key to achieving greater reliability. For example, we were able to contribute our expertise in consultations about improving several models: physical risks, probability of default in the bond Climate VaR, integration in the trajectory of an issuer's decarbonization in the transition risk, and so on.

Lastly, the environmental aspect often receives the most attention among the three ESG factors, but the other two factors—social and governance—are never far behind. Are we soon going to see a [social](#) and governance VaR emerge, especially when we look at other systemic issues, such as human rights and inequality when it comes to human capital? What's certain is that the level of complexity in analyzing and managing corporate bond migration risk will continue to increase, so the ability to establish a rigorous and meticulous credit analysis process has become more important than ever for LDI strategies.

A Risk Too Significant to Be Ignored

Given our planet's changing environment, climate risk is too significant to be ignored, particularly for those who invest for the long-term. In many cases, the investment timeframe for pension asset managers is indefinite, making climate risk a key consideration, particularly if the plan participants skew younger (as they have more time to be affected by climate change). While prudent asset managers cannot take their eyes off the many other investment risks, we believe that they'd be well-served by taking into account the climate risks their portfolios may face now and into the future. By considering their climate value at risk, keeping abreast of changes in the measurement of said risk, and engaging with their portfolio companies, prudent pension managers cannot only help protect their funds, but also affect positive change for their planet.

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