

## Performance of credit in a rising rate environment

For a period of more than 35 years, Canadian interest rates moved higher in a secular upward trend before reaching their peak in 1981, when the Government of Canada 10-year bond yield surpassed 18%. Since then, interest rates in Canada have been in a secular decline, helping generate strong positive returns for fixed income portfolios. It is always challenging to forecast interest rates, but with yields recently having risen from historically low levels, many market participants are questioning whether we have turned the corner and can expect to see interest rates continue to rise from present levels.

A rising interest rate environment should not necessarily be construed as negative for fixed income investments. Results are time frame dependent, and while the initial shock of rising interest rates can adversely impact returns, the resulting higher yield levels increase the return potential for fixed income investments going forward. It is also important to remember that short-term absolute performance across fixed income asset classes is directly related to the speed and magnitude of the upward move in interest rates, with smaller more gradual moves having less impact on performance than sudden spikes. Furthermore, historical and forward looking analysis shows that credit strategies, such as provincial bonds, corporate bonds, mortgages and high yield bonds, tend to outperform federal bonds in a rising rate

environment. Therefore, when appropriately incorporated into a fixed income portfolio, credit strategies can help offset the adverse impact of rising interest rates.

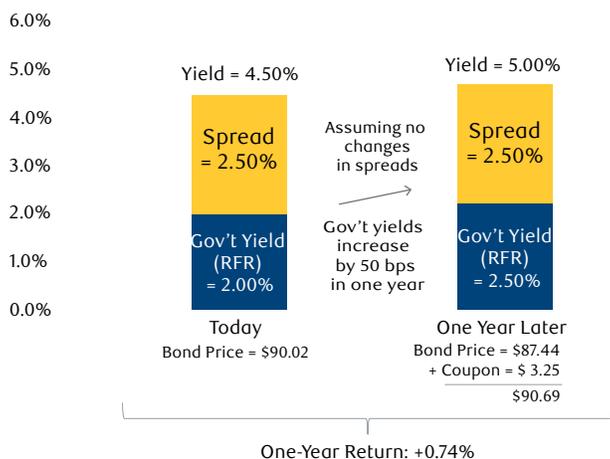
### Dissecting total return

To understand how fixed income credit strategies perform, it is important to first understand what comprises the total return of a bond. The return of a bond is made up of two components: the change in price and the income, or coupon return. The price of a bond has an inverse relationship with the yield; as yields rise, bond prices fall. Investors must also factor in the income or coupon of the bond. It is possible for a negative price return to be more than offset by the income return, therefore resulting in a positive total return.

The examples shown in the following charts illustrate the impact of 0.50% rise in the 10-year Government of Canada bond yield (the risk-free rate) on ABC 10-year corporate bond over a one-year period (Scenario 1) versus over a two-year period (Scenario 2), holding all else constant.

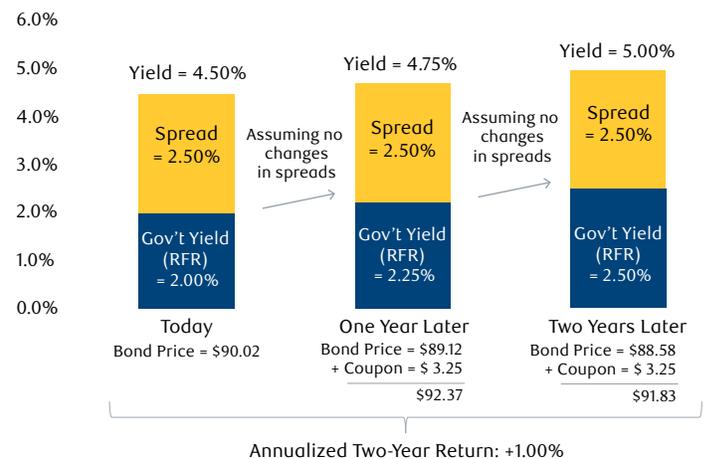
In Scenario 1, as yields increased due to the increase in the underlying Government of Canada rate, bond prices decreased, resulting in a capital loss. However, when taking into account the bond's coupon of \$3.25, the result is a positive total return of 0.74% over the one-year period. In

### Scenario 1: GoC yields increase 0.5% in one year



For illustrative purposes only

### Scenario 2: GoC yields increase 0.5% in two years



For illustrative purposes only

Scenario 2, we have the same 0.50% increase in yields over a longer time period of two years resulting in an annualized positive return of 1.00%. The higher return in Scenario 2 is an outcome of the longer time frame, and indicates that the pace at which yields rise plays a meaningful role in determining the total return of the bond.

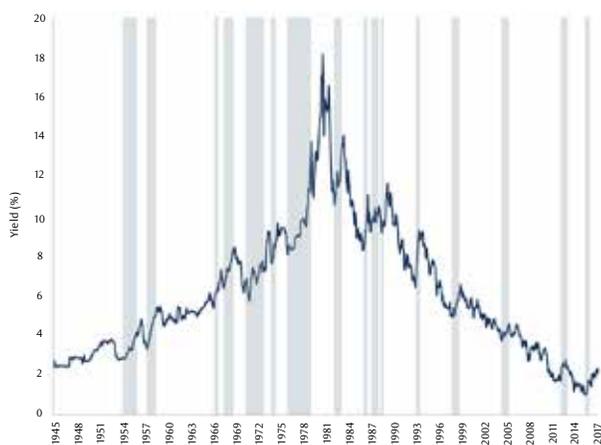
In the above scenarios, we assumed there was no change to the bond's spread, defined as the excess yield over a comparable government of Canada bond. In a scenario where credit spreads tighten, this would partially offset the overall rise in yields and result in a higher total return. However, the opposite would be true if credit spread levels were to widen instead, resulting in lower total returns.

### Historical performance of credit strategies in periods of rising rates

To determine how credit strategies performed historically during periods of rising interest rates, we considered the seventeen periods highlighted in Figure 1. Each period corresponds with a notable rise in interest rates, with each rising rate period lasting anywhere between three and 33 months.

We observed that through these acute periods of rising interest rates, performance of fixed income investments was

**Figure 1: GoC 10-year bond yield monthly data (December 1945 to December 2017)**



Source: PC Bond, For illustrative purposes only

generally negative. However, if we broaden the time horizons to also include several years following each acute rise, performance of fixed income investments was found to be generally positive.

While some of this is explained by the direction of interest rates following each period, the positive returns can also be attributed to the fact that after an initial upward shock in interest rates, the resulting higher yield levels on fixed income investments would generate additional income return potential on a go-forward basis. Notably, over the broader rising interest rate period that spanned 1945–1981 when 10-year government of Canada yields rose 15%, the FTSE Canada Long Federal Bond Index delivered a positive 3% annualized return.

We analyzed all periods since 1945, but will focus our closer examination on periods after 1981 due to the improved breadth and integrity of fixed income market data from this point on. We will consider both negative and positive return periods during this time and examine the factors present during these periods that may have contributed to the varied results. In Figure 2, we examine the behaviour of our base case federal government bonds as well as provincial, corporate, and high yield bonds and mortgages during each of these periods.<sup>1</sup>

The results illustrated in the table support our earlier suggestion that during periods when interest rates rise meaningfully over a short time frame – for example, during the late-2016 “Trump tantrum” – returns are typically negative. However, when interest rates increase in a slower, more gradual fashion, as they did during the September 1998–January 2000 “tech bubble,” returns tend to be less negative or even positive. Furthermore, upon evaluating fixed income performance over the five-year time period that follows the beginning of each rate rise, we found that negative performance impact is more than offset. This is true in all of the periods shown above, as well as in all but one of the periods during the secular rise in rates from 1945–1977.

Importantly, over every period we found that the various strategies moved in directional unison, with credit strategies outperforming federal bonds in both negative and positive return scenarios.

<sup>1</sup> To conduct our analysis, we used the following proxies: for provincial bonds, the FTSE Canada Long-Term Provincial Bond Index pre-1982 and the FTSE Canada Mid-Term Provincial Bond Index post-1982; for corporate bonds, the FTSE Canada Long-Term Corporate Bond Index pre-1982, and the FTSE Canada Mid-Term Corporate Bond Index post-1982; for high yield bonds, the ICE BofA ML U.S. High Yield Bond Master II Index – USD (where spread data for this index was not available, we used the ICE BofA ML US HY Bond Index Yield (USD) less the U.S. 5-Yr Treasury); for mortgages, the PH&N Mortgage Pension Trust; and for federal bonds, the FTSE Canada Mid-Term Federal Bond Index.

**Figure 2: Historical performance of fixed income strategies in periods of rising rates**

Time period	Duration (months)	Increase in yield	Cumulative returns					5-year federal return*
			Mid-Term Federal	Mid-Term Provincial	Mid-Term Corporate	U.S. High Yield	Mortgages	
Apr 1983 - Jun 1984	14	3.5%	-2.9%	-0.1%	-0.3%			11.9%
Mar 1987 - Sept 1987	6	2.8%	-7.2%	-7.0%	-5.6%	-2.2%		9.5%
Feb 1988 - Mar 1989	13	1.3%	3.5%	4.3%	5.6%	9.2%		11.8%
Jul 1989 - Apr 1990	9	2.5%	-5.7%	-5.7%	-4.9%	-5.0%		9.5%
Jan 1994 - Jan 1995	12	2.8%	-7.6%	-6.6%	-5.3%	-1.8%		8.8%
Jun 2005 - Jun 2006	12	0.8%	-1.4%	-1.5%	-1.1%	4.7%	1.7%	5.3%
Apr 2013 - Dec 2013	8	1.1%	-4.2%	-2.9%	-2.4%	2.5%	0.5%	-
Sept 2016 - Dec 2016	3	0.7%	-3.8%	-3.2%	-1.9%	1.9%	-0.7%	-
May 2017 - Dec 2017	7	0.6%	-3.6%	-2.3%	-1.8%	2.6%	0.1%	-

For illustrative purposes only. \*From start of period (annualized).

This is primarily due to two factors:

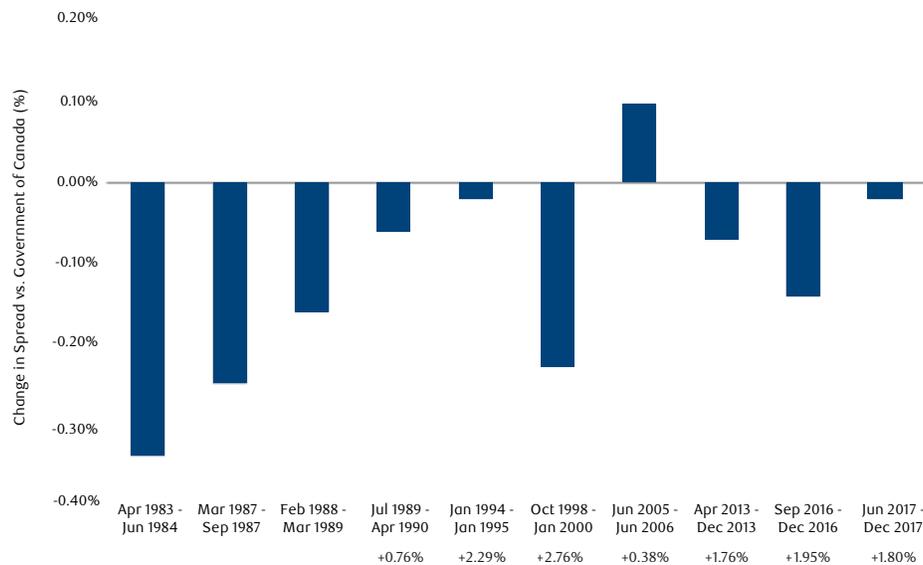
1. Credit strategies generally provide a higher running yield over the risk-free rate offered by Government of Canada bonds, known as the spread. This yield spread is the incremental compensation that the investor receives as a result of the additional credit risk, liquidity risk, and other risk factors that are assumed for investing in such strategies.
2. Our historical analysis found that during periods of rising interest rates, spreads have generally compressed (this occurred in 82% of our observations), as can be seen in Figure 3, which uses the spread changes of corporate bonds as an example.

The broad negative correlation between interest rates and spreads (when rates rise, spreads tighten and vice versa) as well as the higher running yield received for investing in credit strategies both act as a cushion, helping to temper the negative impact of rising interest rates. The parallel between spread compression and rising interest rates is

not surprising; in a typical economic cycle, when growth improves and inflationary pressures rise, government bond yields also tend to rise. Furthermore, as the economy grows, the profitability of companies improves, increasing cash flow predictability and leaving investors with more confidence in their investments. As such, they require less compensation to hold riskier assets, which results in spread tightening. Notably, Figure 3 demonstrates that corporate bonds outperformed federal bonds across each time period, in large part due to the spread compression that accompanied each of these periods.

In addition, as illustrated in Figure 2, our historical analysis shows that credit strategies that have higher spreads – reflecting the riskier nature of the strategy – performed better than strategies with lower spreads in both negative and positive return scenarios. This performance relationship is partly a result of the higher running yield accruing to these riskier strategies, as well as greater spread compression experienced during the various periods of rising rates.

Figure 3: Corporate yield spread change



Source: Bloomberg

### Analyzing expected return of credit in periods of rising rates

With yield levels across fixed income asset classes currently not far from historical lows and market participants expecting interest rates to continue to rise from here, it is prudent to consider the expected performance of various credit strategies during a period of rising interest rates. In the following section of the paper, we will examine two forward-looking scenarios in order to gain a better understanding of the expected performance of credit strategies in such environments.

For our forward-looking scenario analysis, we examined the same four fixed income credit strategies featured in our historical analysis, plus our base case federal government bonds. To assess possible outcomes when the Canadian risk-free rate increases, we considered the two following scenarios:

1. An interest rate rise across the Canadian term structure per forward curve.<sup>2</sup> (Implies an increase of 1.0% on the 10-year part of the yield curve.)
2. A 2.0% parallel interest rate rise across the Canadian term structure.

Figure 4 shows the expected five-year annualized total return for each of the strategies, under the two scenarios discussed above. Given the historical performance of credit strategies during rising rate periods, the outcome of our forward-looking analysis is not particularly surprising. In this example, credit strategy returns are all positive, and the smaller rate increase (forward curves) generates greater returns than the larger rate increase (200 bps parallel rate increase). This outcome further supports the argument that despite what is commonly understood to be true, over a sufficient period of time fixed income returns are not necessarily negative in periods of rising interest rates.

Furthermore, the positive performance is more pronounced with the riskier credit strategies, as the more dramatic yield cushion increasingly offsets the price decline. Recall once more Figure 2, where those asset classes with traditionally higher spreads generally outperformed the more conservative asset classes, largely due to the higher running yield accruing to these riskier strategies along with observed spread compression during these times. The results above exclude this spread compression, however, when factoring this into our forward-looking analysis, the returns of each of the credit strategies in the two rising rate scenarios were even more positive, as expected.

<sup>2</sup> The forward curve is defined as the expected yields on Government of Canada bonds across all maturities at a specified point in the future – in this case, 5 years – based on the views of market participants as at December 31, 2017.

**Figure 4: Five-year annualized total returns<sup>3</sup>**

Asset class	1: Forward curves	2: 200 BPS increase
Mid-Term Federal Bonds	2.1%	-0.7%
Mid-Term Provincial Bonds	2.5%	1.2%
Mid-Term Corporate Bonds	3.2%	2.0%
Mortgages	3.6%	3.4%
*U.S. High Yield Bonds	5.8%	5.1%

\*Note: Returns for U.S. high yield bonds are adjusted to reflect expected defaults. Hypothetical performance analyses are for illustrative purposes only and there is no guarantee that hypothetical returns or projects will be realized.

### Risk considerations of credit strategies

Investors should be aware that adding credit strategies to their fixed income portfolio could potentially result in increased risks. Many of these strategies offer a higher yield spread over similar-term Government of Canada bonds; this spread is an additional compensation to the investor for taking on the added risks (e.g., credit risk, liquidity risk, etc.) of these investments, giving the investor the potential to continue generating performance should interest rates rise. However, the cost of this spread is typically associated with an increase in both absolute volatility and tracking error (the divergence between the price behaviour of a portfolio and the price behaviour of a benchmark). Therefore, investors should consider the reward-for-risk profile of the strategy. Finally, for diversification purposes, investors should also consider whether the credit strategies introduced into their fixed income allocation are correlated with other asset classes in their overall portfolio.

It should, of course, be noted that the base case and more extreme scenarios examined here are not the only possible outcomes. It is possible that interest rates rise by more than expected and/or rise over a shorter period than expected, or that spreads widen. In any of these events, fixed income returns may not align with the results generated by our scenario analysis, and could even be negative, as we saw in several of the historical rising interest rate periods.

### Conclusion

It is challenging to forecast what interest rates will do in the short to medium term, but it remains a possibility that they will move higher from here. As we have discussed, the effects of rising interest rates are time frame dependent and should not automatically be assumed to translate to negative returns for fixed income investments. While the initial shock of rising rates will adversely impact performance in the short term, the additional yield accrual can actually help generate positive returns for fixed income investments over longer time periods. Furthermore, as a result of higher running yields and potential for spread compression, credit strategies tend to outperform federal bonds in these environments. As a result, employing these strategies in a broader fixed income portfolio can be an effective approach to mitigating the negative impact of rising interest rates.

<sup>3</sup> To conduct our analysis, we used the following proxies: for provincial bonds, the FTSE Canada Long-Term Provincial Bond Index pre-1982 and the FTSE Canada Mid-Term Provincial Bond Index post-1982; for corporate bonds, the FTSE Canada Long-Term Corporate Bond Index pre-1982, and the FTSE Canada Mid-Term Corporate Bond Index post-1982; for high yield bonds, the ICE BofA ML U.S. High Yield Bond Master II Index – USD (where spread data for this index was not available, we used the ICE BofA ML US HY Bond Index Yield (USD) less the U.S. 5-Yr Treasury); for mortgages, the PH&N Mortgage Pension Trust; and for federal bonds, the FTSE Canada Mid-Term Federal Bond Index.

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