

Investing in global bonds part II: Developed market sovereign bonds

In Part II of our *Investing in Global Bonds* series, we take a much closer look at the largest subset of the global fixed income landscape: developed market (DM) sovereign bonds. Our objective is to better understand both the risk and return characteristics of this market segment on a standalone basis, as well as to discuss the potential benefits from a diversification and risk-reduction standpoint relative to domestic government bonds. In subsequent papers, we will address the role of global bonds in an objective-oriented investor's portfolio, as well as active management and implementation considerations.

INVESTING IN GLOBAL BONDS PART I: KEY TAKEAWAYS

Our first paper in this series, *The Global Fixed Income Landscape*, examined the diversity of the global fixed income opportunity set, its broad characteristics, and the idiosyncrasies that can be observed in different local markets. Key takeaways from that paper include:

- Institutional investors exhibit a strong home country bias in their fixed income allocations, which can introduce unintended constraints and lead to undesirable market-specific biases, concentrations, or risks.
- A global perspective can augment yield and access different term structures, as well as provide meaningful diversification opportunities by gaining exposure to different economic, fiscal, inflationary, and demographic environments.

For more information, find *Investing in Global Bonds: The Global Fixed Income Landscape* [here](#), or reach out to your Institutional Portfolio Manager.

Background

In our last paper, we divided the global bond market into three major segments: developed markets, emerging markets, and high yield. The first segment, developed markets, can be further segmented into sovereign and investment grade corporate bonds. Each of these market segments are exposed to varying degrees of interest rate risk and credit risk, which in turn impact their return and risk characteristics. Since developed market sovereign bonds typically exhibit lower sensitivity to conditions in credit markets relative to the rest of the opportunity set, there is an intuitive rationale for examining them on a standalone basis. Furthermore, investors will almost always include some exposure to this market segment in their portfolios for very specific reasons – liquidity, risk stabilization, or liability matching, for example – that can differ from the reasons for holding other types of bonds.

The developed market sovereign landscape is primarily comprised of bonds issued by G7 countries that are ultimately underwritten by those nations' population. Generally speaking, these bonds are considered to be the closest thing to a risk-free asset in modern financial terms, primarily due to the countries' high creditworthiness. However, despite extremely low expected risks of defaults, there are differences in demographic, economic, fiscal, and monetary policy dynamics across developed market sovereign issuers. Notably, as illustrated in **Figure 1**, these differences are reflected in the range of sovereign credit ratings across the primary issuers, including Eurozone nations that operate under a unified monetary policy and common currency. However, since a nation has at its disposal a considerably greater array of tools to service its debt (e.g., domestic power of taxation, control of the money supply, international political influence) than other types of issuers, the notion of "risk-free" relative to the rest of the bond market remains justifiable.

Figure 1: Range of sovereign credit ratings

	Rating	Weight
U.S.	AAA	37.2%
Australia	AAA	1.3%
Canada	AAA	1.2%
UK	AA	6.2%
Japan	A	28.2%
Eurozone	-	25.0%
Germany*	AAA	4.1%
France*	AA	6.3%
Italy*	BBB	5.9%
Other	-	0.8%

*Top 3 countries of the Eurozone
 Components of the ICE BofA Global Government Index as at December 31, 2019. Index does not include quasi-government bonds. Credit ratings as reported by Moody's. Note that Standard & Poor's downgraded the United States' AAA rating to AA+ in 2011. Weight according to each sovereign issuer's total market capitalization.
 Source: ICE Data Indices, LLC

Potential benefits of global sovereign bonds

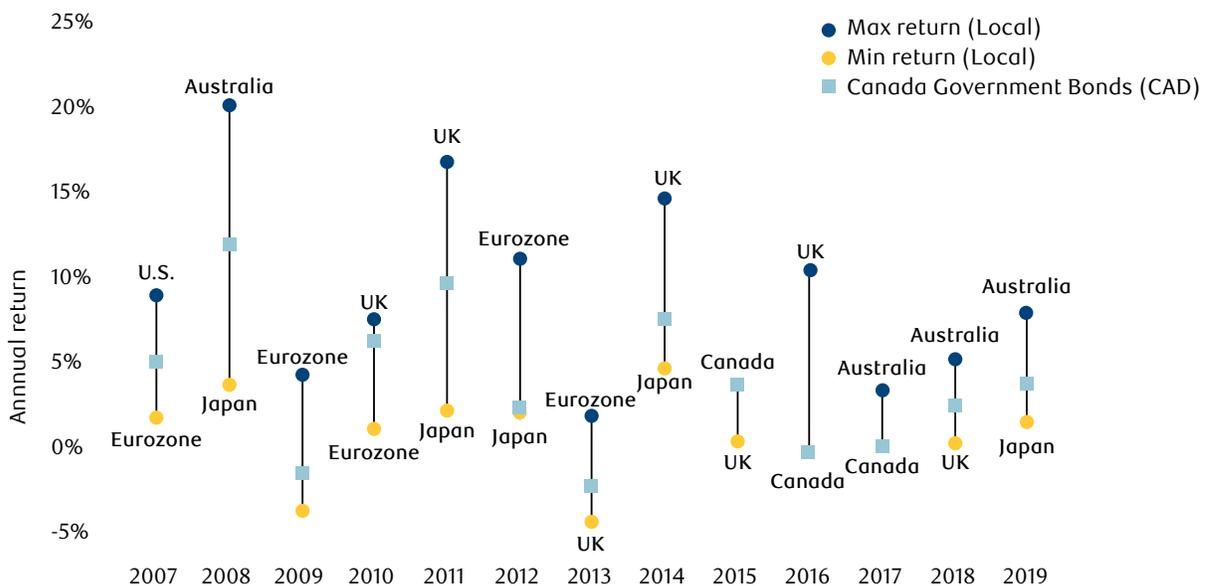
Focusing on the primary constituents of the DM sovereign universe, **Figure 2** below illustrates the range of domestic returns achieved by investors holding bonds issued by their home countries, for each of the last thirteen years. There are three salient observations to be drawn from Figure 2; first, that

different markets under/outperform in different time periods; second, that the dispersion in annual returns across countries can be significant; and third, that not all markets move in the same direction at the same time. Taken collectively, these market dynamics suggest there may be risk-return advantages to adopting a global rather than strictly local approach to investing in sovereign bonds. However, critically, this observation reflects local currency returns achieved by investors operating in their home countries. As we will explore next, these return streams are not achievable directly by a non-domestic investor because of the impact of currency fluctuations. Therefore, a key decision for investors considering global bonds – as is the case with an investment in any asset denominated in a foreign currency – is whether or not to hedge the currency exposures.

Currency considerations and the mechanics of hedging

Only a local investor can access domestic bond returns in their respective markets – a global investor must choose between two options: unhedged or currency hedged. To illustrate how currencies affect the returns of non-domestic bonds, we consider an investment in U.S. treasuries from the perspective of a Canadian investor. Because a Canadian investor cannot access the USD (i.e., local currency) return on treasuries directly, there will always be exposure to another stream of returns in addition to the local returns: either from exchange rate fluctuations or from hedging activities.

Figure 2: Dispersion of returns across sovereign issuers



Source: ICE Data Indices, LLC. Over the period January 31, 2007 to December 31, 2019.

Unhedged returns

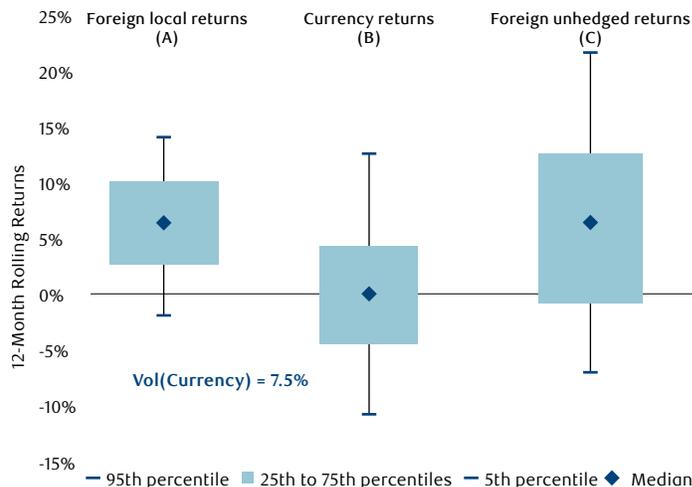
Left unhedged, the total return of a USD-denominated treasury for a Canadian investor includes the local currency return (i.e., the return achieved by a U.S. domestic investor), plus the impact of CAD/USD exchange rate fluctuations:

Foreign local returns	+	Currency returns	=	Foreign unhedged returns
(A)		(B)		(C)

The currency translation effect will either be positive (if the CAD depreciates relative to the USD) or negative (if the CAD appreciates relative to the USD).

Figure 3 illustrates the distribution of the components of total return for a Canadian investor’s unhedged investment in USD-denominated bonds. We can observe that the exchange rate component (B) is very volatile, and that the return achieved by a Canadian investor in U.S. treasury bonds (C) is very different from the one achieved by the local USD investor (A). Consequently, exposure to currency movements adds volatility to the return of USD-denominated treasuries for a Canadian investor. Furthermore, we can observe that the median return from this currency exposure is zero, suggesting that in the absence of any specific views on currency direction, an investor can reasonably expect no reward over the long term for bearing this risk passively. This is also supported by the theory of purchasing power parity.

Figure 3: Building up the CAD-unhedged return distribution



Source: ICE Data Indices, LLC. 12-month rolling returns over the period January 31, 1986 to December 31, 2019.

Hedged returns

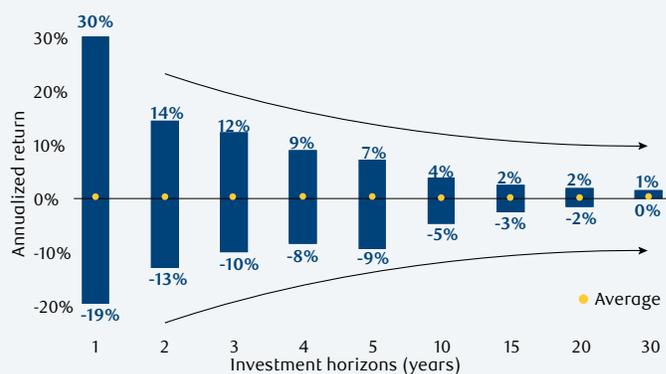
The most common way to remove currency exposure is to enter into a forward contract – an agreement between two parties to exchange a fixed amount of one currency for a fixed amount of a different currency at a future date. The rate at which currencies will be exchanged in the future (forward rate) is set at the initiation of the contract. Consequently, from the moment the forward sale of the foreign currency occurs, the investor is not exposed to actual fluctuations in the exchange rate over the life of the contract.

PURCHASING POWER PARITY

According to the theory of purchasing power parity (PPP), the currency exchange rate between two countries will be in equilibrium when the price of a basket of goods in both countries is equivalent (an economic assumption known as the law of one price). This means that there would be no expectation of a return from currency exposure. In practice however, currencies frequently oscillate around their PPP-implied fair value for a variety of reasons, which leads to significant variance in the currency returns.

Figure 4 depicts the range of returns on the CAD/USD exchange rate over different annualized periods. The variability of the currency return decreases significantly over longer time horizons, suggesting that PPP tends to hold over the very long term (i.e., 30 years). Additionally, despite the return variance from currency even over fairly long-term horizons, the average of the return distribution still tends to be zero.

Figure 4: Historical distribution of CAD/USD currency returns



Source: Bloomberg. Covers the historical period 1950-2019.

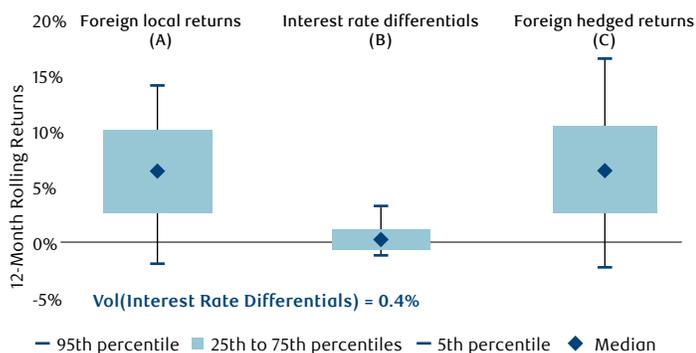
The costs to enter into a forward currency contract include transaction costs, which tend to be negligible,¹ and an interest rate differential embedded in the forward exchange rate, which can either add to or detract from returns. The impact of the interest rate differential on returns depends on whether short-term interest rates in the foreign market are higher or lower than short-term interest rates in the investor’s domestic market. In the example of a Canadian investor hedging the currency exposure of an investment in a U.S. treasury bond, the differential is:

- Negative (investor pays the difference) if U.S. interest rates are greater than those in Canada
- Positive (investor earns the difference) if U.S. interest rates are lower than those in Canada

Foreign local returns	+	Interest rate differentials	=	Foreign hedged returns
(A)		(B)		(C)

Figure 5 plots the distributions of the underlying components of U.S. treasury returns hedged back to Canadian dollars. Compared to the currency component in Figure 3, the interest rate differential component (B) here exhibits considerably less volatility. The resulting hedged return stream (C) is therefore very similar in distribution to the local U.S. market returns (A) being sought. So, while the fixed income returns of a local market cannot be achieved directly by an investor from outside of that market, hedging the foreign currency exposure should lead to a similar return over time, provided that the forward contracts are rolled in a timely manner and that the positions are monitored frequently to avoid excessive drift.

Figure 5: Building up the CAD-hedged return distribution



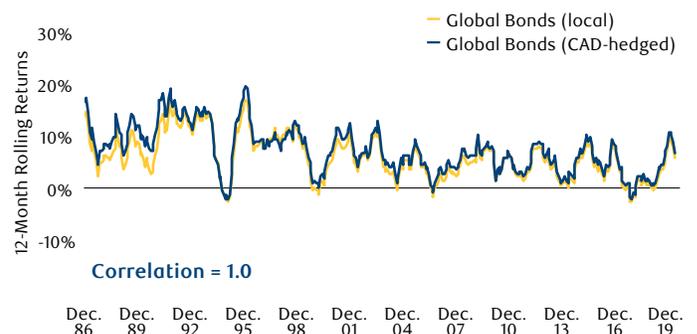
Source: ICE Data Indices, LLC. 12-month rolling returns over the period January 31, 1986 to December 31, 2019.

Currency hedging considerations: summary

An initial examination of local market returns has illustrated the potential benefits of investing in global bonds, but has also emphasized that because of currency exchanges, local market fixed income returns cannot be accessed directly by global investors. While accepting that currency exposure adds significant volatility for no reasonable expectation of a long-term reward for bearing that risk, hedging the currency exposure allows the non-domestic investor to access a return stream that will be relatively similar to the local returns being sought.

The results presented in **Figure 6**, generalized to the global market, support these conclusions. For a Canadian investor in global bonds, the correlation of hedged returns (1.0) is almost perfectly aligned with the underlying local market returns. In other words, when currency exposures are hedged, a Canadian investor in a portfolio of global sovereign bonds should achieve their desired exposure over time. Conversely, **Figure 7** shows that the unhedged returns are highly correlated (0.9) with the underlying exchange rates, meaning that the return experience of a global investor who remains exposed to currency fluctuations is predominantly driven by the currency returns rather than by the desired exposure to the underlying local market returns. This is because the volatility of currency returns is significantly higher than the volatility of the local market returns. It is worth noting that the greater the difference between the currency volatility and the global bond volatility, the more the former will overwhelm the latter and drive the unhedged return stream.

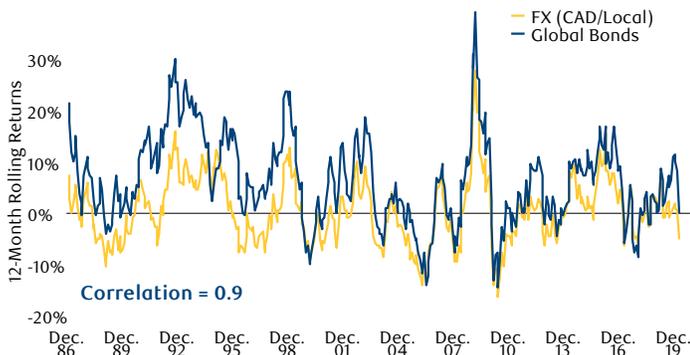
Figure 6: Local vs. CAD-hedged return



Source: ICE Data Indices, LLC.

¹Transaction costs of currency hedging is not as expensive as investors may believe. We estimate transaction costs related to hedging developed markets currencies to be maximum of 5 basis points per annum (average bid-ask spread for rolling 2-month forward contracts 6 times).

Figure 7: FX vs. CAD-unhedged return



Source: ICE Data Indices, LLC.

Risk/return profile of global sovereign bonds

Risk profile

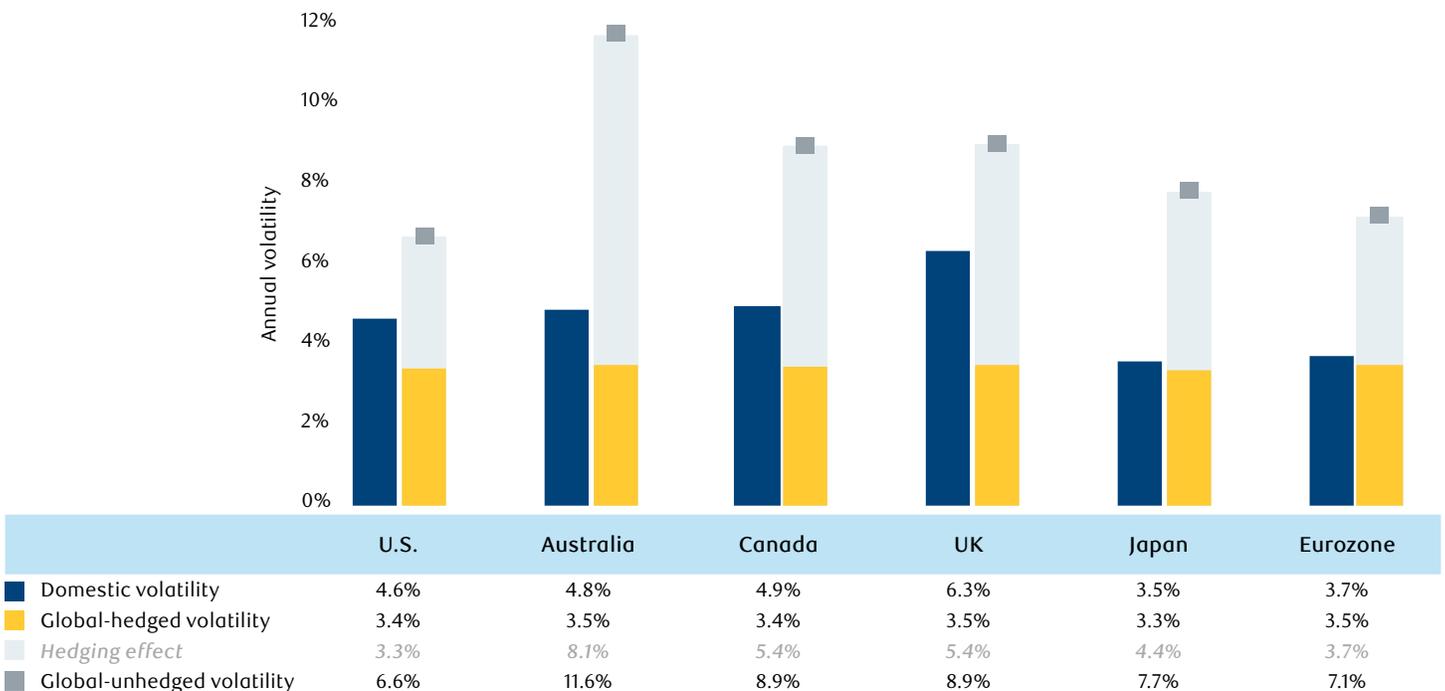
Figure 8 compares the return volatility of several domestic sovereign bond markets to that of the diversified global opportunity set, with and without currency hedging. We offer the following observations:

1. **Domestic volatility:** The return volatility of individual domestic markets varies from region to region. For example, the UK sovereign market exhibits local volatility of 6.3% (high) while the equivalent Japanese figure is 3.5% (low).

2. **Global-hedged volatility:** The return volatility of currency-hedged global bonds is lower than that of any individual region and ostensibly equal to the unachievable local return volatility (3.4%), demonstrating the existence of a risk diversification benefit that is fully achieved when the currency is hedged.
3. **Global-unhedged volatility:** If currencies are left unhedged, the diversification benefits of global bonds are camouflaged completely. In fact, the volatility of an unhedged global bond exposure is significantly higher (ranging from 6.6% to 11.6% depending on base currency) than the volatility associated with an exposure to any individual domestic market (ranging from 3.5% to 6.3% depending on domestic market).

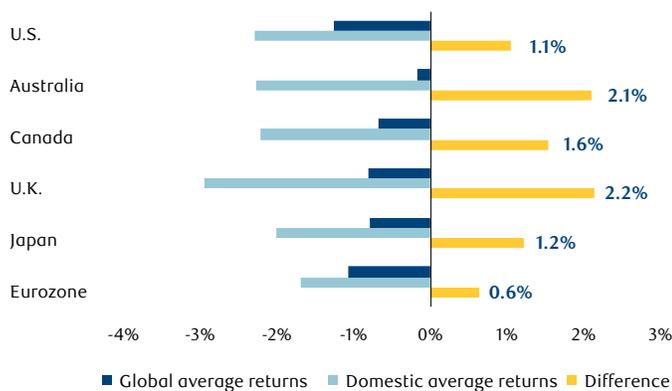
In addition to lower overall return volatility, a currency-hedged exposure to global bonds also demonstrates important downside risk protection benefits relative to a domestic bond portfolio. Figure 9 compares the performance of hedged global bonds against domestic bonds during extreme downside events (for illustrative purposes, the worst 5% of observed monthly returns). We can observe that when each domestic market experienced its most negative monthly returns, currency-hedged global bonds materially outperformed on average. This supports the notion that a more diversified opportunity set with less concentrated exposures is *beneficial during downside events*.

Figure 8: Comparing the volatility of domestic and global sovereign bonds



Source: ICE Data Indices, LLC. Over the period January 31, 1986 to December 31, 2019.

²Volatility of global returns in local currency over the period January 31, 1986 to December 31, 2019.

Figure 9: Sovereign bond performance during down markets

Source: ICE Data Indices, LLC. 12-month rolling returns over the period January 31, 1986 to December 31, 2019.

Return profile

Earlier in this paper, we demonstrated that, ignoring the relatively low transaction costs of hedging currency exposure, it is reasonable to expect similar long-term returns from a hedged vs. unhedged exposure to global sovereign bonds (and the risk side of the trade-off clearly favours the hedged position, as illustrated in Figure 8). That said, when comparing running yields, an investor might wonder about the long-term return expectations from a currency-hedged exposure to global sovereign bonds versus their domestic baseline, especially when foreign yields are lower than domestic ones. For example, why would a Canadian investor who could earn a 1.70% yield on a domestic 10-year bond want to invest in a Japanese 10-year bond with a yield of -0.02%³⁷?

When it comes to the long-term return of a currency-hedged foreign bond, the theory of covered interest rate parity (CIRP) suggests that it should be the same as that of a corresponding domestic market bond, no matter the difference in observable yields within the local markets. This is because the forward exchange rate should offset any observed differences in yields and thus eliminate opportunities to realize a higher return.

While the theory of CIRP may not hold over short or even medium-term horizons (short-term under/outperformance can exist between markets from year to year), the similar longer-term returns of domestic vs. currency-hedged global bonds shown in **Figure 10** supports the argument that CIRP should hold up over a long-term period. Indeed, over the long term, *hedged global bonds have generally performed in line with most individual domestic bond markets.*

Figure 10: Comparing the returns of domestic and global sovereign bonds

	Domestic	Global-Hedged
U.S.	6.0%	6.3%
Australia	8.6%	9.3%
Canada	6.9%	7.0%
UK	7.9%	7.9%
Japan	3.7%	3.7%
Eurozone	6.3%	6.4%

Source: ICE Data Indices, LLC. Over the period January 31, 1986 to December 31, 2019.

Conclusion

There are several reasons why expanding the scope of an asset class's opportunity set could be beneficial, from risk reduction to return enhancement. When it comes to the largest component of the global fixed income opportunity set – the developed sovereign bond market – the primary benefits we observe on a standalone basis relative to various domestic bond markets are *risk reduction* and *diversification*. More specifically:

- The ability to access diversification over time
- The ability to lower volatility versus all major domestic government bond markets
- The ability to better preserve capital during downside events

However, a very important consideration is that the aforementioned benefits *are only observable when the underlying foreign currency exposure is hedged*. As we demonstrated, currency ends up being the primary return driver when the global sovereign bond exposure is unhedged, resulting in more risk and no reasonable expectation of a long-term premium for bearing that risk. Hedging, on the other hand, tends to result in a near-perfect replication of the desired (but uninvestible) local return stream, producing a favourable risk profile. Lastly, the long-term return of a global exposure tends to be very similar to that of the domestic home base; combined, these factors imply a potentially better risk-adjusted return trade-off.

In the next installment of our *Investing in Global Bonds* series, we will investigate the historical risk and return profiles of the remainder of the global opportunity set, namely investment grade corporate bonds, high yield, and emerging market debt. The objective will be to consider how the introduction of an additional risk factor – *credit spread* – might generate a different set of conclusions with respect to return, risk, and diversification compared to what we observed with sovereign bonds, and to determine whether currency hedging is as beneficial when investing in this segment of the global market.

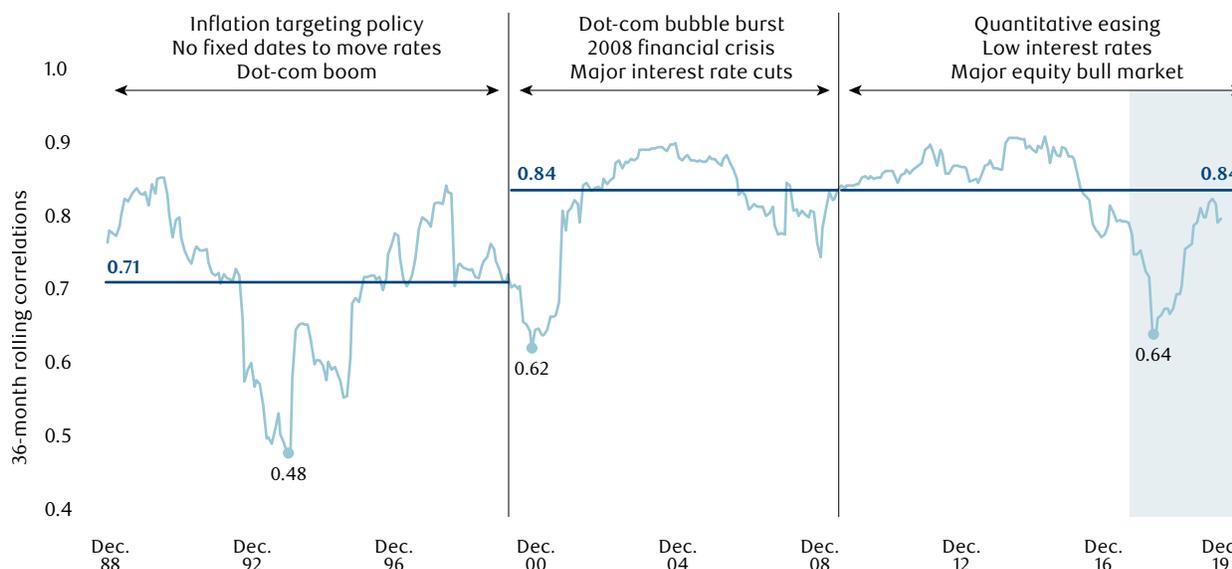
³⁷10-year sovereign bond yield as at December 31, 2019. Source: Bloomberg.

Appendix

One often-cited characteristic of an increasingly globally integrated world is that the benefits of geographic diversification are decreasing and that the correlation behaviour of the past may no longer apply in the future. In **Figure 11**, we consider the behaviour of the correlation between two markets that have an historically strong degree of inter-relationship, namely the U.S. and Canada, over the course of more than thirty years. While we can clearly see an upward trend occurring across successive economic cycles, the correlation continues to vary significantly across

time. While individual regions are perhaps more susceptible to global events today than they were in the past, they are still highly influenced by local factors: inflation rates, economic conditions, and fiscal and monetary policy. In this particular case, different economic circumstances in Canada and the U.S. have influenced their respective central banks' monetary policy decisions, resulting in some marked differences in the direction of Canadian and U.S. interest rates. Consequently, *diversification benefits can still exist, even between two highly integrated economies.*

Figure 11: Rolling correlation of returns between Canada and the U.S.



Source: ICE Data Indices, LLC. 36-month rolling returns over the period January 31, 1986 to December 31, 2019.

This document has been provided by PH&N Institutional for information purposes only and may not be reproduced, distributed or published without the written consent of PH&N Institutional. It is not intended to provide professional advice and should not be relied upon in that regard.

PH&N Institutional takes reasonable steps to provide up-to-date, accurate and reliable information, and believes the information to be so when printed. The views and opinions expressed herein are those of PH&N Institutional as of the publication date and are subject to change without notice. This information is not intended to be an offer or solicitation to buy or sell securities or to participate in or subscribe for any service.

Information obtained from third parties is believed to be reliable, but no representation or warranty, express or implied, is made by PH&N Institutional, its affiliates or any other person as to its accuracy, completeness or correctness. We assume no responsibility for any errors or omissions.

PH&N Institutional is the institutional business division of RBC Global Asset Management Inc., an indirect, wholly-owned subsidiary of Royal Bank of Canada.

®/™ Trademark(s) of Royal Bank of Canada. Used under licence.
© RBC Global Asset Management Inc., 2020.