The Nasdaq-100
To Hedge or Not to Hedge Currency Exposure

June 2022

Richard Lin, CFA, *Index Research Sr Specialist*
Sanjana Prabhakar, *Index Research Specialist*

While the Nasdaq-100 Index® (NDX®) has been down this year, it is still outperforming other broad-based indexes including the S&P 500, Dow Jones Industrial Average and Russell 1000 over a longer-term time horizon, i.e., trailing 3-year, 5-year, 10-year time period, per FactSet. In the recent months, the Nasdaq-100 has been weighed down by mounting concerns around the global economy. The war in Ukraine, inflationary pressures, and a Covid surge in China have created significant pressure on the tech-heavy index. Nasdaq fell 13% for the month of April, its worst monthly performance since the autumn of 2008. Its performance in May was much less extreme, with the index down about 1.7%. For the long-term, however, investors have a reason to be optimistic, as the secular growth story behind many technology companies remains intact. During the pandemic, the Nasdaq-100 rallied, as demand for digital technologies soared. In response to the crisis, the Fed lowered interest rates and stepped in to keep credit flowing, which minimized the economic fallout. Markets remained on an upward trend till the end of last year. Since the beginning of the year 2022, however, there has been a drawdown, with the Nasdaq-100 down 22.3% YTD, as investors remain increasingly concerned about broader risks in the macroeconomic environment including the war in Ukraine and supply chain constraints.

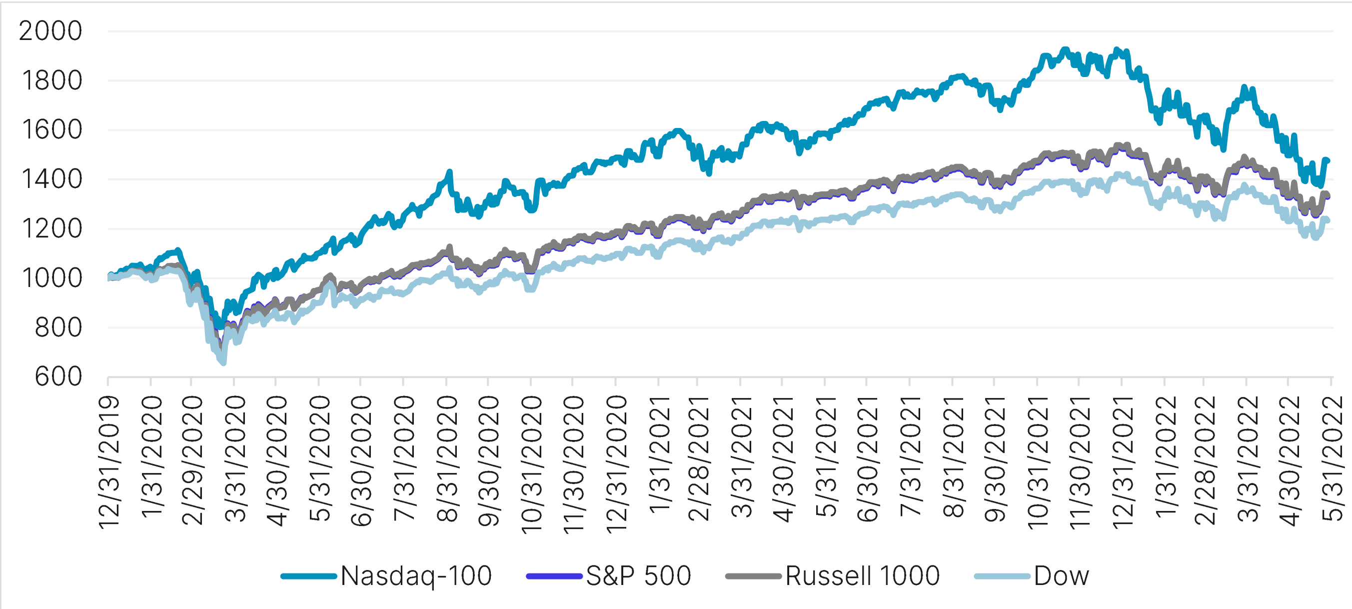
Investors domiciled outside the U.S. face an additional headwind in terms of foreign exchange risk. This risk arises due to currency fluctuations. Should there be changes in the relative value of the currencies, the local currency return can significantly deviate from the US Dollar (USD) return of the Nasdaq-100. For investors interested in mitigating currency risk from investing in the Nasdaq-100, Nasdaq offers an index solution that uses forward exchange contracts to manage currency risk.

In the current environment, the dollar is strengthening versus other major currencies as the Fed adopts a more aggressive stance towards monetary policy. Should there be a reversal in the trend of the dollar in the medium term, then investors domiciled outside the U.S., specifically Canada, are likely to benefit from mitigating currency risk.

As observed historically, there are megatrends that affect the currency market in the long-term, and micro-cycles that affect the market in the near-term.

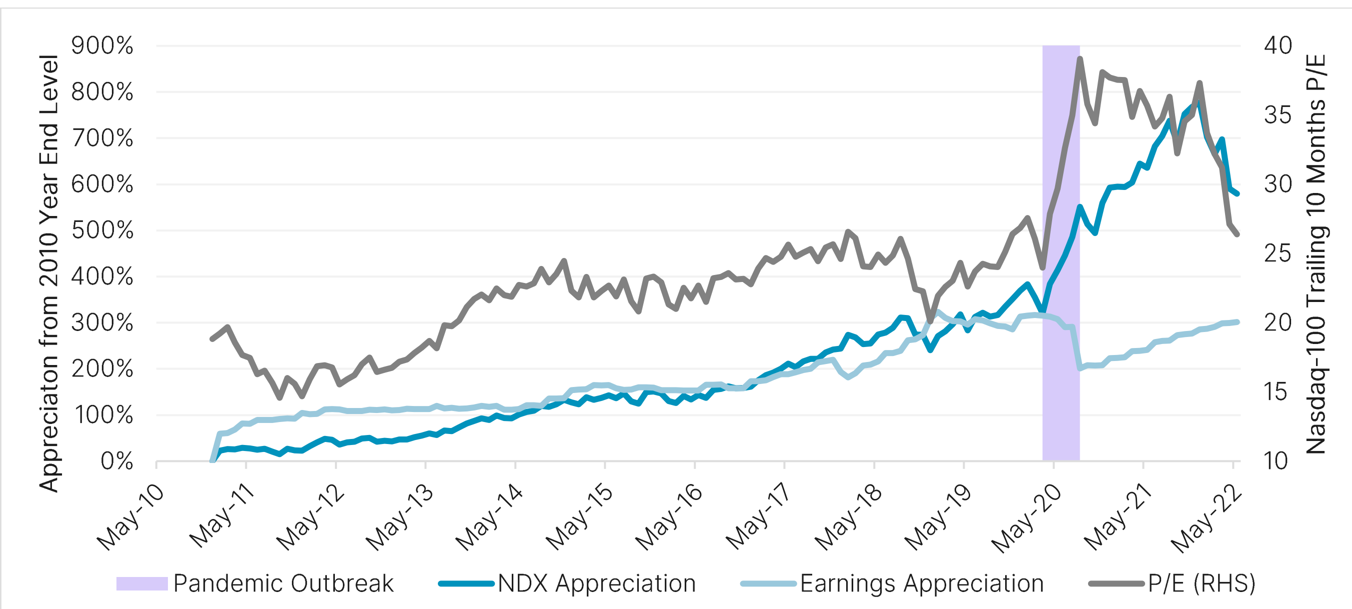
Canadian investors looking to mitigate foreign currency risk can benefit from tracking two Nasdaq Indexes, both the hedged and unhedged Nasdaq-100 Indexes, specifically, the Nasdaq-100 Canadian dollar (CAD) Total Return Index™ (XNDXCAD™) and the Nasdaq-100 Currency Hedged CAD Total Return Index™ (XNDXCADH™). Whether to invest in a hedged or unhedged index would ultimately depend upon the specific circumstances of the investor including investment horizon (short-term, medium-term or long-term), risk appetite (risk-averse, risk-neutral or risk-acceptant), and state of the currency markets. While hedged indexes can mitigate currency risk in certain circumstances, underlying equity risk remains.

Nasdaq-100 Performance vs. Benchmarks since Year-End 2019



Source: Bloomberg data as of May 31, 2022

Nasdaq-100 Long-Term Valuation



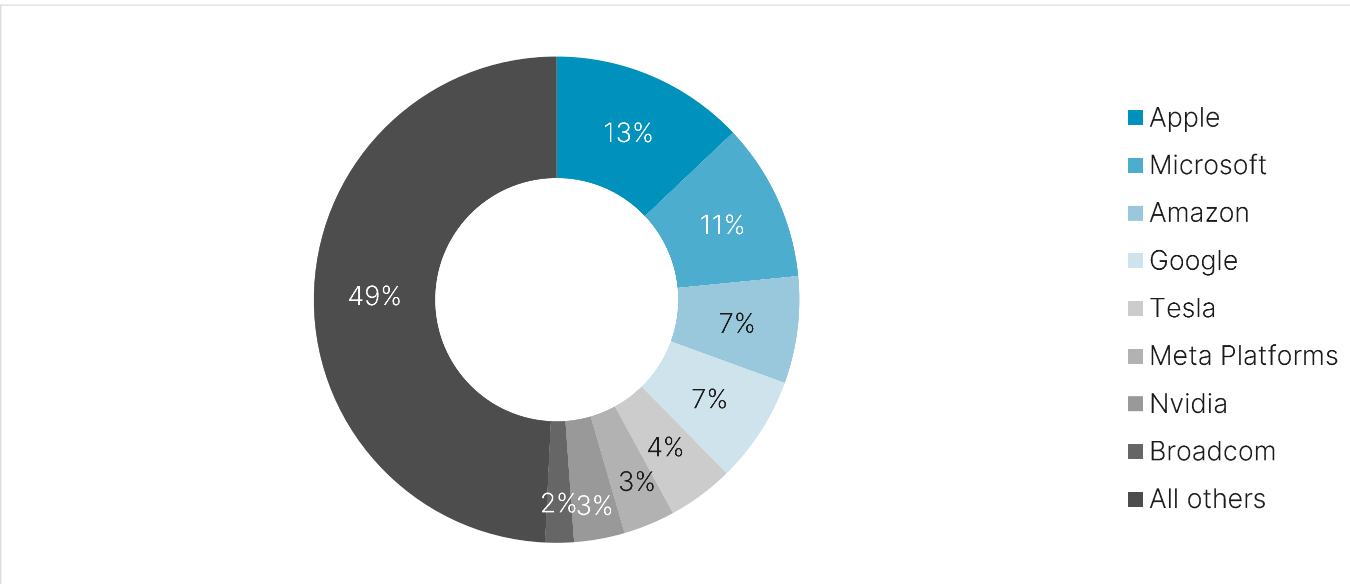
Nasdaq-100 at a Glance

The Era of Tech Mega-Caps

- Of the top ten NDX components, eight companies represent the era of Tech Mega-Caps, and are at the forefront of technological innovation – whether they operate in the Consumer space, Enterprise, or both

- Six out of these eight companies are formally classified as Technology as per ICB (Apple, Microsoft, Google, Meta Platforms, Nvidia, Broadcom)
- Two companies are classified as Consumer Discretionary (Amazon, Tesla)
- Collectively, these eight companies contribute just over 50% of the index weight
- Average market cap for the eight companies as of May 31, 2022, was $1.12 trillion
- Total revenue for the eight companies for the year 2021 was $1.52 trillion
- Total annual R&D expense for the eight companies for the year 2021 was $170 billion

Top 10 Constituent Weights (%)



Source: Nasdaq as of May 31, 2022

Nasdaq-100 Performance in the Lens of Global Investors

The Nasdaq-100 has been closely tracked by global investors as it offers exposure to some of the most celebrated technology companies such as Apple, Alphabet, Amazon, and Meta Platforms. These companies have revolutionized the way individuals and businesses operate. The index represents companies that are at the forefront of innovation and are well-positioned for long-term growth. For investors domiciled outside the U.S seeking exposure to the Nasdaq-100, there are several local currency denominated Nasdaq-100 indexes. For example, Canadian investors can benefit from the NDXCAD™ (the Canadian dollar version of the Nasdaq-100), European investors can benefit from the NDXEUR™ (the Euro version of the Nasdaq-100), and Japanese investors can benefit from the NDXJPY™ (the Japanese Yen version of the Nasdaq-100). By offering these indexes in local currencies, Nasdaq broadens the pool of available investors who can benefit from gaining exposure to prominent technology trends.

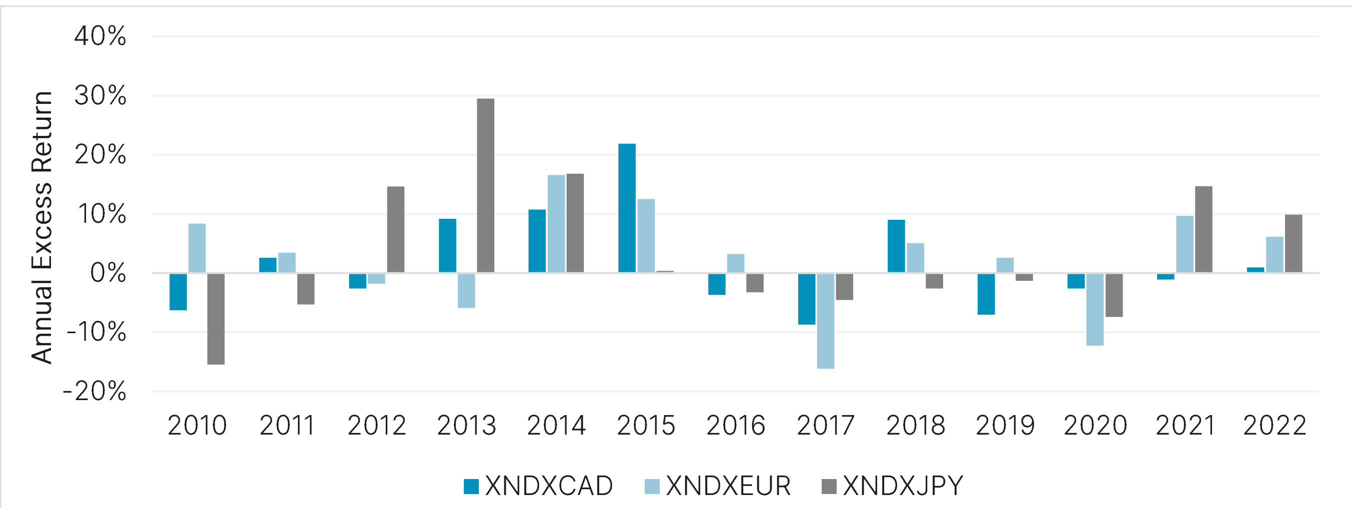
Investing in local currency denominated Nasdaq-100 indexes is not free of risk, as investment returns when converted to local currencies can differ from returns in USD. These differences may be due to changes in the relative value of the currencies involved. For descriptive purposes, we have listed the annualized local returns for XNDXCAD™, XNDXEUR™ and XNDXJPY™.

Annual Total Return of Nasdaq-100 in Local Currencies

Year	XNDX	XNDXCAD	XNDXEUR	XNDXJPY
2010	20.1%	13.9%	28.5%	4.7%
2011	3.7%	6.2%	7.1%	-1.7%
2012	18.4%	15.7%	16.5%	33.0%
2013	36.9%	46.1%	31.0%	66.4%
2014	19.4%	30.2%	36.0%	36.2%
2015	9.8%	31.6%	22.3%	10.1%
2016	7.3%	3.6%	10.5%	4.0%
2017	33.0%	24.3%	16.8%	28.4%
2018	0.0%	9.0%	5.1%	-2.6%
2019	39.5%	32.4%	42.0%	38.1%
2020	48.9%	46.3%	36.6%	41.4%
2021	27.5%	26.4%	37.2%	42.2%
2022*	-22.3%	-22.2%	-17.5%	-13.2%

Source: Nasdaq, 2022 data as of May 31, 2022

Annualized Local Excess Return of Nasdaq-100 against the USD Total Return



Source: Nasdaq as of May 31, 2022

Foreign exchange risk management becomes critical in an environment of fluctuating exchange rates

Traditionally, importers and exporters of goods were the most important players in the foreign exchange markets, trading currencies through banks. Over time, financial investors have become increasingly active in FX markets.

Foreign exchange (FX) risk, also commonly referred to as currency risk or exchange rate risk, refers to the difference in realized returns in local currency from the nominal returns in base currency, and is a significant risk faced by investors domiciled outside of the United States. Besides currency risk, investors must mitigate other risks to their investments including political risk, macroeconomic risk, and asset risk. In the current environment, investors are dealing with inflationary pressures in the United States, rising interest rates, the fallout of the geopolitical crisis in Russia, and slower global economic growth. What is worth noting is that these risks can have a minimal impact on returns, if mitigated. In the case of foreign exchange risk, investors can enter foreign exchange contracts to limit losses.

Investors and international trade practitioners are likely to benefit from understanding the factors that drive foreign exchange risk before implementing risk mitigation solutions such as FX contracts. When two parties enter a contract to trade goods or currencies, FX risk arises due to fluctuations in exchange rates. Further, when a party is set to receive money from another country whose currency has depreciated against their local currency, the party stands to lose as they receive less in local currency terms. Factors that cause a currency to depreciate include interest rate differentials, political instability, weakening economic fundamentals, high current account deficits and high inflation.

Parties exposed to foreign currency risk can benefit from entering foreign exchange contracts to mitigate exchange risk. A foreign exchange contract is a special type of contractual agreement entered into by two parties to exchange a pair of currencies in the future. The contract must be executed at the expiration date at the agreed upon exchange rate. The parties involved in the contract are interested in hedging against unexpected changes in currencies. The downside of such a contract is that it must be executed at the agreed upon price, irrespective of changes in views of the currency.

Consider the case of an exporter, based out of Toronto who will be receiving payment in US dollars for goods exported to the US. Two scenarios are likely to play out—one, where the Canadian dollar depreciates against the USD, and another where the Canadian dollar appreciates against the USD. In the first case, the exporter gets more money when she converts the USD to Canadian dollars, and will, therefore, benefit from keeping the contract unhedged. In the second case, the exporter will get less money when she converts the USD to Canadian dollars, and will therefore, benefit from entering a foreign exchange contract to sell the US dollar at a pre-determined exchange rate.

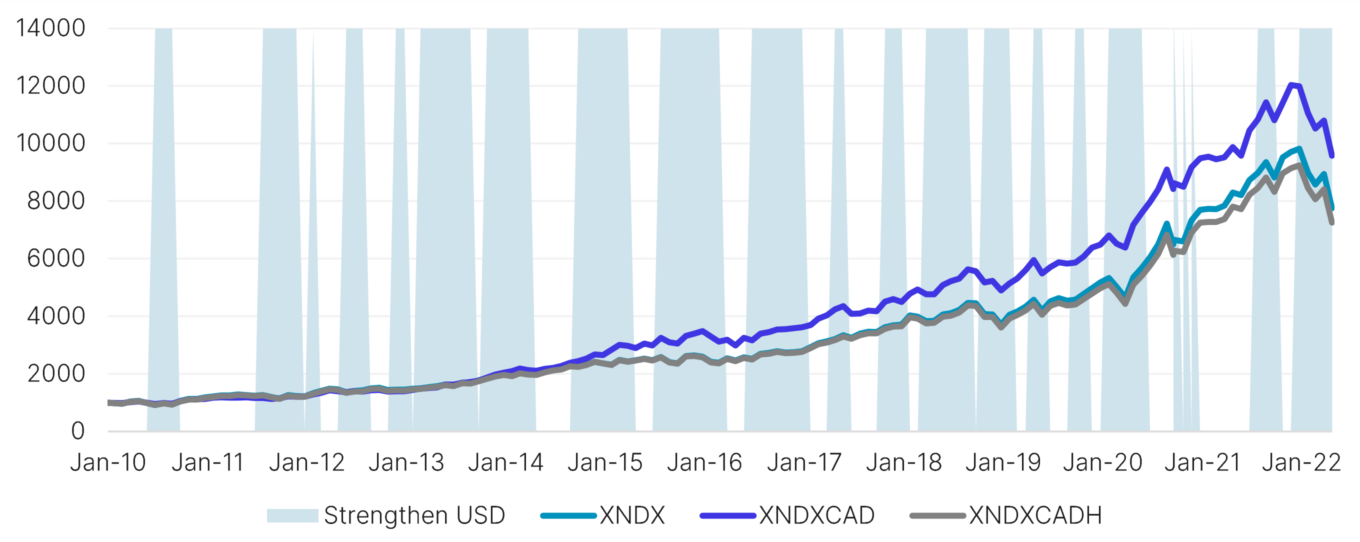
The foreign exchange contract will limit the gains of the exporter should the currency move in the opposite direction of what is expected. For example, should the exporter enter a contract with the expectation that the USD will depreciate against the dollar, but it appreciates by say 5% as a response to an unexpected Fed rate hike, then the contract will have to be executed at lower than the current exchange rate. Thus, by protecting against currency risk, a hedged strategy limits gains (and losses).

Introducing the Nasdaq-100 Currency Hedged CAD Total Return Index

Canadian investors interested in gaining exposure to the Nasdaq-100 and earning returns in Canadian dollars can invest in two leading indexes, namely the Nasdaq-100 Canadian Dollar Total Return Index (XNDXCAD) and the Nasdaq-100 Currency Hedged CAD Total Return Index (XNDXCADH). These two indexes represent returns of the Nasdaq-100 in Canadian dollars. The Nasdaq-100 Canadian Total Return Index (XNDXCAD) is a currency-unhedged strategy, where the investor earns returns in Canadian dollars, but is not protected from currency risk. The Nasdaq-100 Currency Hedged CAD Total Return Index (XNDXCAH) is a currency-hedged strategy, where the investor earns returns in Canadian dollars, and is protected from currency risk. Recall that currency risk refers to changes in the relative value of currencies. This strategy is implemented by selling forward exchange contracts at 100% of index values. Investors can lock in an exchange rate, thereby mitigating the exchange rate risk of their investment. Should the US dollar depreciate against the Canadian dollar, then the investor will benefit from the decision to hedge.

If we closely examine the historical lookback window between January 8, 2010, and May 31, 2022, the XNDXCAD index, our unhedged strategy returned 858%, or an equivalent of 19.7% annualized. The XNDXCADH, our currency-hedged strategy returned 626%, or an equivalent of 17.2% annualized. As with our findings in our previous study, the hedged strategy XNDXCADH continues to closely track the XNDX, further validating the effectiveness of our hedged strategy in mitigating currency risk. The unhedged strategy outperformed both the hedged strategy and the NDX, suggesting that the effectiveness of the hedged strategy is limited to certain specific conditions.

Cumulative performance of XNDXCAD and XNDXCADH



Source: Nasdaq, Total Return Time Horizon from January 8, 2010, to May 31, 2022

When reviewing the performance by calendar year, the hedged strategy (XNDXCADH) outperformed the unhedged strategy (XNDXCAD) six out of eight calendar years when the USD weakened. This indicates that the currency hedged strategy largely worked as intended and can effectively protect investors against a weakening USD. When the CAD weakened and the USD strengthened, the unhedged strategy (XNDXCAD) outperformed the hedged index (XNDXCADH) all five calendar years. The hedging strategy largely works to mitigate currency risk when the dollar weakens and will limit the gains if the currency moves in an unexpected direction.

	XNDX	XNDXCAD	XNDXCADH	USDCAD
Cumulative Return	675%	858%	626%	22%
Annualized Total Return	17.8%	19.7%	17.2%	1.6%
Annualized Volatility	20.4%	20.4%	20.6%	8.0%

Source: Nasdaq, Total Return Time Horizon from January 8, 2010, to May 31, 2022

Calendar Year Total Return Performance

USDCAD column represents the U.S. dollar currency returns measured in terms of Canadian dollars. Grey rows mark the years with a strengthening Canadian dollar.

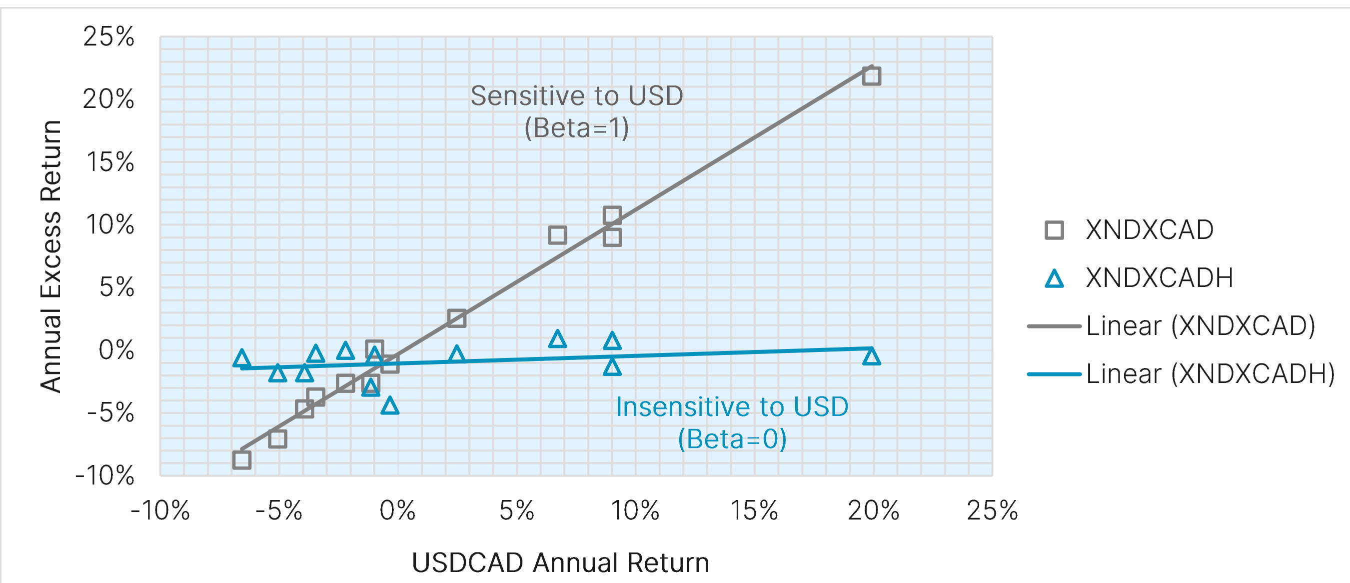
Year	XNDX	XNDXCAD	XNDXCADH	USDCAD
2010*	18.1%	13.4%	16.3%	-3.9%
2011	3.7%	6.2%	3.4%	2.5%
2012	18.4%	15.7%	18.4%	-2.2%
2013	36.9%	46.1%	37.9%	6.7%

2014	19.4%	30.2%	20.2%	9.0%
2015	9.8%	31.6%	9.3%	19.9%
2016	7.3%	3.6%	7.1%	-3.5%
2017	33.0%	24.3%	32.4%	-6.6%
2018	0.0%	9.0%	-1.2%	9.0%
2019	39.5%	32.4%	37.7%	-5.1%
2020	48.9%	46.3%	45.9%	-1.2%
2021	27.5%	26.4%	23.1%	-0.3%
2022	-22.3%	-22.2%	-22.6%	-1.0%

Source: Nasdaq, Total Return Time Horizon from January 8, 2010, to May 31, 2022

Currency-Hedging (XNDXCADH) largely removed sensitivity to currency (USDCAD)

In the chart below, we plot annual excess returns of hedged and unhedged indexes on the Y-axis against currency returns on the X-axis. We plot a regression line to analyze the relationship between excess returns and currencies. We closely look at the beta coefficient to understand how sensitive the index is to currency movements. The unhedged index (XNDXCAD) has a beta of 1 and is sensitive to currency risk. The hedged index (XNDXCADH) has a beta of 0 and is insensitive to currency risk. It follows that should there be currency fluctuations, an investor can benefit from tracking the hedged index as it is largely insensitive to currency risk.



Source: Nasdaq, Total Return Time Horizon from January 8, 2010, to May 31, 2022

To hedge or not hedge would depend upon movements in USDCAD prices

For Canadian investors looking to invest in the US stock market, it becomes critical to have a strategy to mitigate currency risk. For the lookback period, the unhedged (XNDXCAD) has significantly outperformed the hedged index (XNDXCADH). It is also safe to conclude that during periods when the dollar depreciates against the Canadian dollar, an investor would benefit from a hedged strategy.

Prior to the financial crisis and going back to early 2000, the Canadian dollar strengthened against the USD buoyed by a strong economy and higher oil prices. It is worth noting that the Canadian dollar has historically moved upward with rising commodity prices, which in turn, move with rising or falling global demand. During the 2008-2009 financial crisis, there was a flight to safety with the US dollar viewed as a safe haven. Oil prices also declined dramatically from approximately $134 in June 2008 to $39 in February 2009. With the decline in oil prices, the Canadian dollar weakened. There was also a strong demand for the US dollar as the financial obligations of the banks had to be honored. Also, post the financial crisis, almost all central banks resorted to a liberal monetary stance to improve liquidity in their domestic markets which led to further appreciation of the dollar.

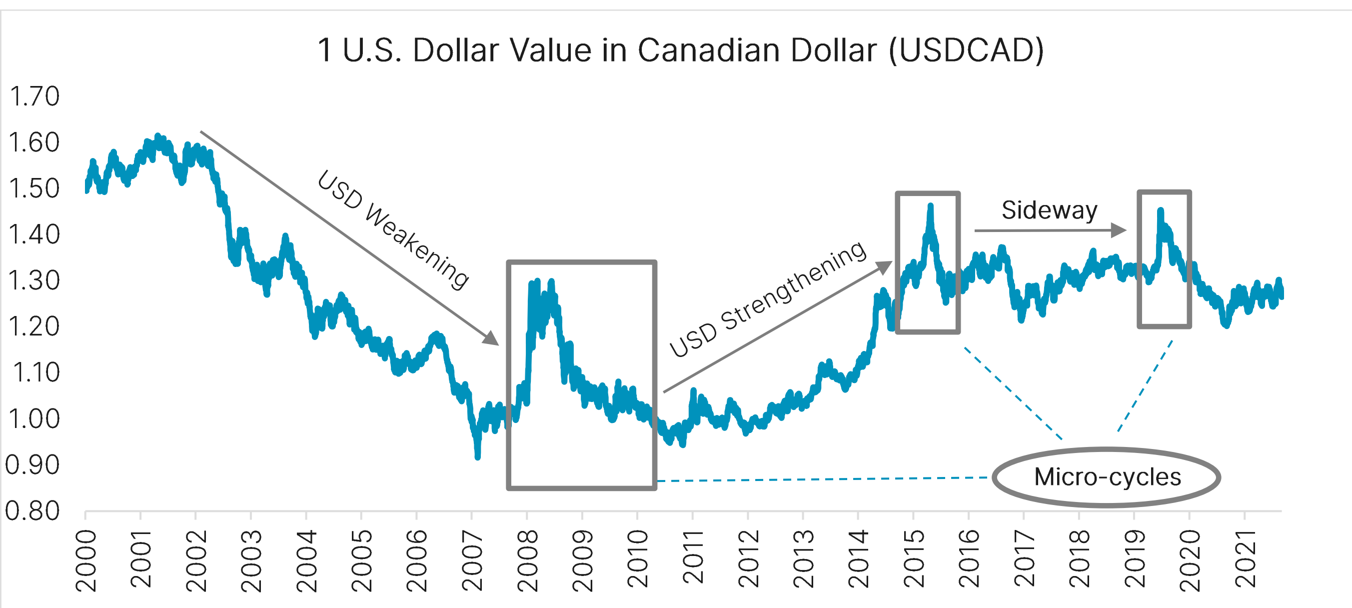
During the period 2010-2015, there was a steady appreciation of the dollar due to a relatively strong US economy (making it a more attractive destination for foreign capital), a strong trade balance (which acted as a tailwind for the dollar), improving budget deficits, and higher interest rates relative to the German 10-year yield and 10-year Japanese government bond yield. Other factors that led to an appreciation of the dollar included concerns about a Greek debt crisis and struggles in the EU to boost economic growth, which made the dollar relatively more attractive versus other currencies.

In 2015, there was a spike in the dollar again, as the Fed announced that it was ending its quantitative easing program and raising rates, which led to fears of a slowdown. Economic reforms slowed growth in China in 2015, which pushed investors to invest in the dollar. Also, oil prices collapsed which led to a weakening of the Canadian dollar. Again, the dollar was attractive relative to other currencies.

Post 2015, the USD and CAD moved largely in lockstep up until the recent pandemic. During the period 2016-2020, the value of the US dollar repeatedly fluctuated versus other currencies due to uncertainty around the trade wars and policies of the Trump Administration. From 2020 onwards, the US dollar strengthened again as investors looked for safety amid concerns surrounding the pandemic.

In the most recent months, the US dollar has been strengthening on the heels of an announcement of a rate hike by the Fed. As the Fed is adopting a more aggressive monetary policy relative to the Eurozone and Japan, the dollar is showing relative strength versus other major currencies.

The currency market is filled with mega trends and micro-cycles



Source: FactSet, Nasdaq from October 2000 to May 2022

The current macroeconomic environment has led to one of the most uncertain and challenging periods for investors to navigate in decades. Inflation in the US and in many parts of the world is at levels unseen in more than four decades. After many years of mostly synced monetary policy among major central banks, the Fed has been forced into an unusually hawkish stance to tame inflation, potentially triggering a recession depending on how long the current rate-hiking cycle lasts. Even if most sources of inflation are addressed, commodity inflation – especially with respect to energy – may endure given the unprecedented level of sanctions against Russia. It is thus very difficult to predict whether the USDCAD rate will continue to reflect US dollar strengthening, if it might soon reverse, or even if it might enter a sideways range with elevated volatility. Canadian investors who are confident that USD appreciation will work in their favor may choose to track the unhedged Nasdaq-100 Index, but for all others, the hedged option offers a conservative, time-tested solution to limit the impact of currency fluctuations on their returns.

Sources: Nasdaq Global Indexes, Factset, Bloomberg