The Four Dimensions of Managing Currency Risk in Global Equity Portfolios

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Canadian investors buy foreign equities to gain exposure to global equity markets and their associated risk premiums. They expect to earn a higher return than offered by domestic securities, and/or to benefit from increased diversification. Currency fluctuations can have a dramatic impact on the performance of international investments. This article analyzes the role of currency hedging in managing the risks of foreign equity investments and discusses four different ways to reduce the currency risk.

The two sources of risk when investing in global equities

An investor in foreign equities is exposed to two sources of risk: local equity market risk and currency risk. These risks are not independent and vary with each foreign market and currency. Even the distinction between them is blurred as many companies are in fact large multinational players, with operations in many countries and currencies. The risk from exchange rate fluctuations may come from different sources: interest rates and inflation, monetary policy, trade balances and concurrent macro-economic conditions. A very important source of risk affecting both the local market and the currency is the structure of the economy itself. For example, some international markets are dominated by single sectors such as commodities or banks. We expect them to react differently depending on the economic cycle. Some markets, for various historical, political or economic reasons are considered as “safe havens” but they are far from risk-free.
Currency volatility is not constant. It rises and falls following its own rules. In addition, the proportion of global equity return volatility attributed to currencies is not constant over time. During periods of low local market volatility, it might be significant. Consider the following graph showing the share of volatility coming from currencies compared to local equity market volatility within the MSCI World Index:

The four dimensions of managing currency risk

The first dimension of managing currency risk is to thoroughly analyze the main driving forces of foreign equity markets and corresponding currencies. It helps to break currencies into three main groups which tend to behave differently.

The first group is made up of so-called "safe haven" currencies. The USD belongs to the first group as the most important global currency. U.S. stocks represent the biggest proportion of global equity markets by value. Historically, CAD/USD exchange rate fluctuations have helped to reduce the risk of investments in U.S. equities. The reason is the counter-cyclical nature of the USD. The USD is used as a "reserve" currency by many central banks because it tends to appreciate during times of economic stress. The behavior of the CAD/USD exchange rate has helped reduce U.S. equity investment risk for Canadian investors. Two other currencies with a similar behavior across the economic cycle are the Japanese Yen and the Swiss Franc. They are held in significant quantities by governments, institutions and individual investors as part of their foreign exchange reserves. Because the exchange rates of the CAD to the USD, Japanese Yen and Swiss Franc have historically helped to reduce investment risk, most Canadian investors have preferred to leave their equity positions in these currencies unhedged.

The second group of currencies has very different characteristics. They are issued by countries with economies that expand and contract strongly with the global economic cycle. These countries rely heavily on exporting commodities and are more likely to experience cyclical capital flows resulting in pro-cyclical behaviors. They tend to fluctuate in the same direction as their equity markets. In addition to Canada — Australia, New Zealand and Norway are all typical examples. Leaving these currencies unhedged will amplify the total return volatility for a Canadian investor. This fundamental reasoning points in the same direction as the empirical evidence based on historical data.

Finally there is a third group of currencies that are the most difficult to predict. Their behaviors don’t exhibit strong patterns and most of the time follow the appreciation or the depreciation of the main sectors of the local economy. There are periods, however, when they also move in the opposite direction. There could be various reasons for this, the most common being political. A typical example is the British Pound (GBP). The Euro also falls into this third group. A historical quantitative analysis won’t be of much help in deciding whether or not to hedge.
Understanding these three groups and their interactions with global equity markets is just the first step to solving the problem of using currency hedging to reduce the volatility of foreign investments. We need to add a second dimension related not only to the countries of origin of the underlying asset but also to their volatility. To understand the concept, consider the following example: buying a one-month foreign treasury bill or a foreign diamond mining company stock.

In the case of the money market instrument, almost all of the risk for the Canadian investor comes from fluctuations in the exchange rate. This risk could be greatly reduced and virtually eliminated by hedging 100% of the foreign currency exposure. However, in the case of the mining company, the currency risk is just a small proportion of the total risk and consequently the percentage of hedging should be a lot lower. The same logic applies to global equity portfolios. Less volatile equities will require more hedging. As the volatility of the equities increases, the amount of currency hedging should be reduced. The historical hedge ratios minimizing the risk to foreign equities by country and volatility quintiles are shown below:

### Equity risk and optimal hedge ratio

![Equity risk and optimal hedge ratio chart]


It is evident that the first and the second dimension of managing currency exposure cannot be separated. For example, a Canadian investor would always be better off hedging their exposures to Australian stocks regardless of their volatility, because the Australian Dollar (AUD) is even more cyclical than the CAD. On the other side of the spectrum, only the least volatile U.S. equities benefit from partial currency hedging in order to reduce risk.

Managing currency exposure is not a static process, which is why there is a third dimension that follows the same line of thought as the previous example.

Global equity market volatility fluctuates over time. There are periods of high stress, when the returns of even the most stable, mature and defensive companies vary wildly. During these periods, investors are less concerned about currency risk as it is dominated by local equity market volatility. Hedging during such episodes should be limited to only the most cyclical currencies. There are other periods, when even the most risky stocks barely move and behave as low volatility equities. As we saw in the very first chart of the article, in such periods, currency risk dominates and a prudent investor should hedge more of their currency exposure. For simplicity, we could characterize three volatility regimes: high, mid and low and then select the appropriate hedging strategy for each currency, considering jointly the first two dimensions.

### Example of volatility regime within global equity markets

![Example of volatility regime within global equity markets chart]

Source: MSCI and TDAM. Regimes based on median absolute deviation of daily volatility measured over rolling 21-days.

In addition to being intuitive, such a rules-based approach is easy to implement and will further reduce the contribution of currency risk to foreign equity return volatility. This can be illustrated in the charts on the next page using the MSCI World Index as an example.
So far we have analyzed three common approaches to reducing the risk of foreign equity investments. However, there is one important dimension we have not yet discussed: currencies, equities and hedging percentages are all correlated.

There is no simple way to add the fourth dimension without introducing an appropriate risk model that accounts for all that information. Commercial risk models are typically based on a single base currency, or in the best case, they consider only fully hedged and unhedged equity positions. Unfortunately, they come short when a global portfolio is comprised of equities with different levels of hedging. A custom-made, in-house highly sophisticated risk model is needed to optimally construct a portfolio which will satisfy all these requirements. Using an inappropriate risk model could result in a sub-optimal equity allocation by country and may expose the investor to currency risk. When the goal is to minimize the risk, as in the case for the low volatility strategies, these differences could be significant:

![Graph showing realized volatility of full hedged vs. volatility regime hedged MSCI world index](image)


The example above partially hedges Euro, GBP, AUD and New Zealand Dollar currency exposures. The risk model based on a single currency (CAD) cannot act on that information, because it is "blind" to the existence of the currency hedges. However, when the hedging information is part of the risk modeling, the weights are shifted towards countries or regions whose currencies are hedged as they are now considered less risky.

**A multidimensional hedging strategy**

Optimally hedging selected currencies increases the breadth of a global equity strategy. As such, it is expected to help reduce the risk of a portfolio of foreign equities. This is especially important in the low volatility equity environment witnessed up till the end of 2017, and even more vital for strategies taking less risk such as low volatility funds. This article outlined four different ways to establish an appropriate currency hedging strategy, starting from the simplest and ending with the one that will likely satisfy even the most sophisticated investors.

![Graph showing optimal equity weights by country for global low volatility strategy](image)

Source: MSCI and TDAM. Optimal portfolios constructed with factor risk models created by TDAM.