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Currency Risk: To Hedge or Not To Hedge—Is That The Question?

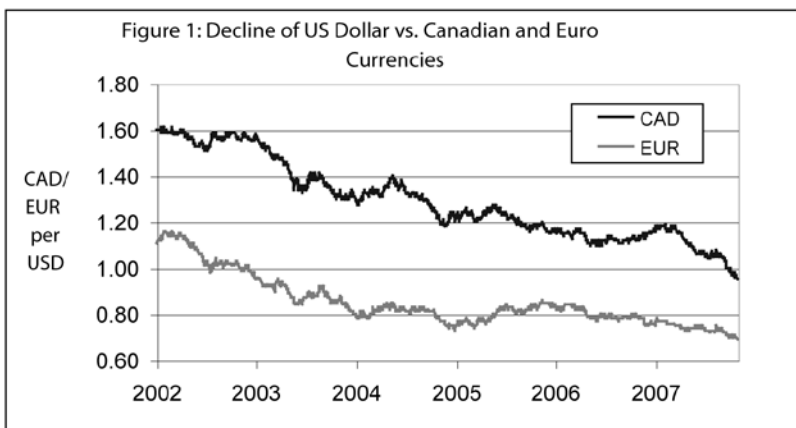
by Steve Scoles

At age six, I started trading currencies. Nothing major—just the British Pound and various Middle-eastern and South Asian currencies. After a few years, I found I could not make consistent profits at FX. So at age nine, in 1981, I shifted to 100 percent fixed income to take advantage of the impending bull market in bonds.

I must admit that story, while mostly true, is slightly embellished. When I was a kid, my family moved from Canada to Saudi Arabia. Because of our various travels in the region, I managed to receive my allowance in about a dozen different currencies. Upon returning to Canada, I converted my life savings back to Canadian dollars. (And invested all \$100 in a government savings bond yielding an astounding 19 percent.)

The point of the story is that at a young age I was exposed to a variety of currencies and was sometimes affected, both positively and negatively, by their fluctuating exchange rates.

Now I am in my thirties and working in Asset-Liability Management where currency fluctuations continue to pose problems. Indeed, the last five years have seen some very dramatic currency moves, particularly versus the U.S. dollar. For example, as of October of 2007, the U.S. dollar has depreciated close to 40 percent versus both the Canadian dollar and the Euro since 2002. (See Figure 1.)



Source: Bank of Canada

The Question

In insurance companies and pension plans currency risk arises when a company has future obligations in one currency and investments in another currency. The question that is often asked is whether this currency risk should be hedged or not.

My view is that currency risk should almost always be hedged. Instead of asking whether to hedge or not, the questions that should be asked are: “To make a bet or not to make a bet?” and “Do we truly have the ability to predict currency movements?”

It is important to recognize that a foreign investment involves both a position in the underlying debt or equity and a position in the foreign currency. Leaving currency risk unhedged is really making a bet on that foreign currency.

This article briefly reviews the common arguments against currency hedging and shifts the perspective on taking currency risk. It also gives me a chance to apply my favorite tool for thinking about risk management—the Kelly Formula.

Arguments Against Currency Hedging

The common arguments against currency hedging tend to fall into five categories:

- 1) The expected return of currencies is zero—so don't bother hedging.
- 2) We can predict currency movements—so we will actively manage currency exposure.
- 3) Currencies are mean reverting—the currency exchange rate will come back to where it was.
- 4) Currency offers uncorrelated risk—so adding currency risk to my portfolio should improve the portfolio's overall risk.
- 5) Currency hedging adds costs.

The Kelly Formula

Before tackling the arguments against currency hedging, it is useful to review the Kelly formula which I have found to be a great way to think about risk management.

In the 1950's, John Kelly, an AT&T Bell Labs scientist, determined the optimal betting strategy for gambling that maximized the bettor's bankroll expected growth rate.

The Kelly formula was used most famously by mathematician Ed Thorp, who initially applied it to favorable situations in the card game blackjack until he was threatened with harm from the mob-run casinos. He later applied the formula to the financial markets through a hedge fund that has achieved phenomenal long-term returns.

The basic Kelly formula for how much to wager on an even-money bet (a bet where you either double up or lose) is:

**Fraction of bankroll to wager = $2p - 1$
(where p = probability of winning)**

For example, let's say you are betting on a fair coin flip. Whether you pick heads or tails, your probability of winning is 50 percent. In this bet, the Kelly formula would say to wager nothing:

$$2 \times 50 \text{ percent} - 1 = 0\%$$

If it was an unfair coin such that heads comes up 60 percent of the time, the Kelly formula says to wager 20 percent of your bankroll on heads:

$$2 \times 60 \text{ percent} - 1 = 20\%$$

And if the coin always comes up heads, you should wager 100% of your bankroll:

$$2 \times 100 \text{ percent} - 1 = 100\%$$

The main idea of the formula is that the size of your bet should be a function of how large your edge or advantage is. If you have no advantage, i.e. like in a fair coin flip, you should risk nothing.

In the investment world, probabilities are rarely exact enough to use the formula with precision, but it does provide a great framework for thinking about risk management. The formula forces you to think about whether you truly have an edge in a proposition and to focus only on situations where you do have an edge.

Argument 1: Expected Returns of Currency are Zero

There have been some historical studies on portfolios of currencies over long investment horizons that have shown currencies on average have an expected return close to zero. Given these historical results, people often view this as a reason to not bother hedging.

However, applying the Kelly formula, if you have an expected return of zero, you should not risk anything. In other words, if you believe currencies have an expected return of zero, it is then a reason to hedge rather than a reason to not hedge. Under this

argument, taking currency risk is akin to betting on fair coin flips.

Argument 2: We Can Predict Currency Moves

The Kelly formula does say that if you do have an edge then you should risk some of your capital. So if you do have the ability to predict currency moves with meaningful accuracy, then you should consider taking currency risk. However, the key here is to determine if you truly do have that ability. In reality, many market participants are over-confident in their abilities, making this self-evaluation difficult.

As an example to illustrate this over-confidence, I had a recent conversation with the head of a large equity investment management company. In discussing the merits of a Canadian investor hedging their U.S. dollar exposure, he proudly scoffed, "why would you want to hedge? The Canadian dollar has already made its move." Within six months of that conversation, the Canadian dollar appreciated a further 20 percent against the greenback.

I am not using this example to prove that hedging was the correct action to take because of what happened subsequently. Rather, I am using it to illustrate the dangers of over-confidence when dealing with financial markets. As financial writer Jason Zweig puts it, "we're even over-confident about our ability to overcome our own overconfidence!"

Argument 3: Currencies are Mean Reverting

The mean reversion argument bears similarities to both of the above arguments, but it deserves special attention. Mean reversion is the idea that while currencies will fluctuate, they will return to a mean level over a long-term horizon. This argument tends to show up in the real world with phrases like: "the currency is hitting long-term highs, it's due for a pull back" or those famous last words in finance, "it can't go any lower than this."

While I agree that it appears markets have a tendency to overshoot appropriate levels from time to time, I do not think mean reversion follows as a rule. If the market is mean reverting, it is probably often reverting to a future unknown mean rather than a past calculable mean.

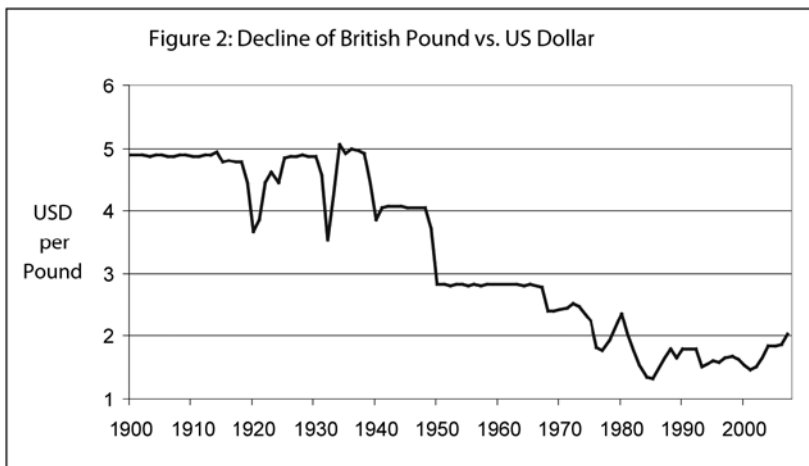
One of the starkest examples against reversion to the mean in currencies is how the British Pound fared against the U.S. dollar in the 20th century. Up until about 1940 or so, the British Pound was the world's reserve currency (before the U.S. dollar took over). From 1935 to 1985, the pound sterling declined almost 80 percent versus the greenback. (See Figure 2.)



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Perhaps there is someone out there born in the 1930's who will live long enough to see the pound sterling mean revert!

Source: Lawrence H. Officer, "Exchange rate between the United States dollar and the British pound, 1791-2004." *Economic History Services, EH.Net, 2005.*

Argument 4: Currency Offers Uncorrelated Risk

The idea that uncorrelated risk is good comes from the mean-variance framework of modern portfolio theory. In the context of looking at only assets, that may be fine. However, it is important to remember that insurance companies and pension plans are highly leveraged propositions. Our long-term guarantees to policyholders and plan members require us to measure risk vis-à-vis the liabilities rather than simply looking at the assets. That is, asset value fluctuations are not important as long as the liability value fluctuates in the same way. In this asset-liability context, currency risk adds to the overall risk rather than reduces it.

Argument 5: Currency Hedging Adds Costs

The implementation of a currency hedge involves derivatives which add costs (and counter-party risk). Rather than view these costs as part of the hedging decision, they should be viewed as part of the overall evaluation of the foreign investment. If the costs of currency hedging outweigh the benefits of the

underlying debt or equity instrument, then the foreign investment should simply not be done.

Conclusion

When it comes to currency risk, the crucial error people make is to ask the wrong question: to hedge or not to hedge. Instead, the questions that should be asked are: "To make a bet or not to make a bet?" and "Do we truly have the ability to predict currency movements?" For most, leaving currency risk unhedged is akin to betting money on coin flips. ☹

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