

3Q18

TOPICS OF
INTEREST

Verus⁷⁷⁷™

A different approach to currency investing

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Executive summary

*For many investors, foreign currency represents one of the biggest risks in their portfolio. In our first Topic of Interest paper¹ of a three-part series on currency, **The Cost of Not Hedging Foreign Currency**, we outlined the risks involved with currency exposure in international portfolios, and how a fixed hedge can be an important first step in managing those risks. A key conclusion from the first paper was that unhedged embedded currency exposure in a typical international portfolio should be viewed as an uncompensated risk because it has not provided an appropriate level of return to justify its contribution of volatility to the total portfolio. While hedging currency exposure may be a good starting point, a different approach for investors who want to retain currency exposure is to change the nature of the exposure itself to one that has offered an appropriate return for the risk taken. This can potentially be accomplished with currency beta, which can be thought of as similar to passive management in equity markets, and which uses factor-based benchmarks to better describe the reality of the currency market. Compared to the currency exposure embedded in a developed international equity benchmark (MSCI EAFE, for example), currency beta² has experienced higher returns with lower risk, and provided more diversification to a 60/40 global portfolio. For investors who are prepared to have foreign currency in their portfolios we believe currency beta may provide an improvement upon the currently commonly used embedded currency exposure – or the “unhedged” element of most portfolios.*

Introduction

While currency beta is a relatively new concept in institutional investing, the idea was first used in practice by Deutsche Bank more than 10 years ago. Even after more than a decade of live trading history, which provides strong evidence for the existence of return drivers in the currency market, currency beta strategies have yet to experience widespread use. Many investors believe investing in currency is a zero-sum game because currency trades are implemented in a long/short framework; if one currency appreciates, another currency must depreciate by an equal amount. However, by identifying the drivers of currency returns, we can better describe what we mean by the currency market, and can identify the compensation for risk that investors are paid for exposure to that market (when we define it correctly).

This paper will start with a brief overview of factor-based investing and how this concept applies to currencies. Next, we will clearly define what is meant by currency beta, introduce the underlying return drivers or factors in the currency market, and display how this approach can be implemented. Finally, we will discuss how currency beta can be incorporated at the total portfolio level to potentially improve risk-adjusted returns.

Factor-based investing

Factors are the characteristics of an investment that help explain its returns over time. They can be thought of as the compensation an investor receives for passively bearing a risk. For example, the most well-known factor in equity markets is the market factor – more commonly known as equity beta. Typically, most of an individual stock's return can be explained by the return of the total equity market. If an investor wants to gain exposure to the market factor, all she has to do is invest in a market index. Many additional factors have been identified that help explain asset performance, and these have been popularized through the evolution initially of style products, and then later smart beta products. While currency beta has significant differences from traditional smart beta strategies, it is a useful comparison for someone who is unfamiliar with the concept. The main difference between these two ideas is that smart beta attempts to change the returns of a portfolio invested in a market which has already established benchmark, while the goal of currency beta is to define a benchmark for the currency market as a whole in the absence of a standard benchmark³. However, the basic concept of factors underpins currency beta.

Defining a currency benchmark

The neutral starting point for any portfolio exposure is a benchmark that is representative of the entire market. For most exposures, selecting a benchmark is a relatively straightforward process. In equities, for example, weighting each stock by its market capitalization is generally accepted as the best representation of the market. Since an appropriate benchmark is the neutral starting point, an investor can easily determine the type and magnitude of her

active bets by comparing her portfolio to the benchmark – any deviations away from the benchmark are characterized as active bets. In a prudent portfolio construction process, each of these active bets in the portfolio is carefully considered, but currency is typically overlooked for two reasons: 1) Foreign asset and currency exposures are usually lumped together into one benchmark, making it a challenge to unpick the individual bets in each exposure, and 2) unlike traditional public assets, defining a neutral starting point for currency exposure is a difficult exercise.

As discussed in our previous paper, the embedded currency exposure is not a good definition of a benchmark because it is naively determined by the domestic currency and the market capitalization of the portfolio. Another potential option is a GDP or trade-weighted currency index. However, neither of these options address the fundamental question of what drives currency return behavior. Instead, the behavior of the currency market can be described by identifying the factors which explain it, and empirical research has shown that three factors do in fact drive the core behavior of the market. In particular, work done by Momtchil Pojarliev and Richard Levich in their book, [A New Look at Currency](#)⁴, provides important empirical evidence to support this claim. Pojarliev and Levich found they could explain most of professional currency manager's returns with factors. Many managers have simply identified these betas, created portfolios using them and sold these portfolios as though they represented alpha. More than this, though, they also identified the fact that some managers behave quite differently, and do in fact generate true alpha. This combination – many managers simply replicating something that looks a lot like beta, with a small group producing true alpha – provides the basis for using the resulting currency beta more broadly. An appropriate currency benchmark should therefore be a simple, rule-based portfolio with systematic exposure to these factors, and is what we refer to as currency beta. As Ian Toner (Verus CIO) mentioned in the book, [The Role of Currency in Institutional Portfolios](#)⁵, currency beta may be best thought of as a “descriptive beta” - not as a robust and explanatory as the beta in equity markets, but valuable enough to use as a measurement tool for both the market and active managers.

Factors in the currency market

Three factors: carry, value, and momentum, have been shown to explain much of the return behavior in the currency market. The carry factor invests in higher yielding currencies by selling lower yielding currencies, the value factor invests in lower valued currencies by selling higher valued currencies as determined by purchasing power parity⁵, and the momentum factor invests in currencies with high momentum by selling currencies with low momentum. Both value and carry have fundamental economic reasons to help explain why they have been able to generate excess returns over the long-term. The success of momentum has been attributed to investors' behavioral biases, which are well documented across many financial assets with robust results.

Carry

Interest rate differentials determine the forward price for all currency pairs. The forward price of a currency with a higher relative interest rate will be lower than the current spot price, meaning the investor in the higher yielding currency receives a discount. If there is no change in the spot exchange rate over the life of the forward contract, this investor will earn the interest rate differential between the two currencies. If the higher yielding currency appreciates or does not depreciate by more than the interest rate differential, a carry trade will have a positive return, which has generally been the case in normal market risk environments. However, carry trades have been subject to drawdowns in times of global market stress. Compensation for bearing this risk is one explanation as to why carry trades have been profitable. The risk of a drawdown in the carry factor is an important reason currency beta portfolios are diversified among the three factors, which will be discussed in more detail later.

Value

At its core, currency exchange rates are a transfer of purchasing power between markets. Assuming a 1:1 exchange rate, if an investor exchanges \$100 for €100, he or she is essentially trading the opportunity to buy goods and services denominated in U.S. dollars for the opportunity to buy goods and services in euros. Theoretically, goods and services offered in two open markets with different currencies should cost the same amount, a concept known as purchasing power parity. In our simple example of a 1:1 exchange rate, \$100 should buy the same number of Big Macs at a McDonalds in the U.S. as €100 does at a McDonalds in Germany. In reality, currencies tend to drift from this equilibrium value and then revert back over time for a variety of reasons including inefficiencies between markets, unexpected changes in inflation and interest rates, and behavioral trading biases, to name a few. The value factor takes advantage of currencies' tendency to mean revert to purchasing power parity by going long undervalued currencies and short overvalued currencies.

Momentum

The existence of momentum challenges part of the efficient market theory, which states past returns have no predictive power of future returns. Robust research has shown that currencies with recent positive performance have continued to outperform currencies with recent negative performance⁷. Momentum has also been well documented in equities. While there is no fundamental economic reason momentum should exist, several well-known behavioral biases provide a possible explanation. The simplest of these explanations is investors tend to extrapolate past performance into the future, naively expecting winners to keep winning and losers to keep losing. This is just one possible example; many other investor biases could be playing a role in momentum as well. The momentum factor in currency beta exploits these behavioral biases.

Currency beta construction

The construction of a currency beta portfolio is relatively simple. A systematic, rules-based approach is used to create three equally weighted portfolios for each of the factors discussed above. The available currencies in the universe (typically G10) are ranked based on their attractiveness to each factor, and then the top three ranked currencies are purchased by selling the bottom three ranked currencies. Each factor portfolio is constructed separately and then equally weighted to create the overall currency beta portfolio. At the end of each rebalancing period (usually monthly) all currencies are ranked again and the same construction process is followed. Exhibits A and B show the 3-year rolling performance and risk of each of these currency factors in addition to the overall currency beta portfolio.

EXHIBIT A – 3-YEAR ROLLING RETURNS



Source: Morningstar, MPI, as of 4/30/18

EXHIBIT B – 3-YEAR ROLLING RISK



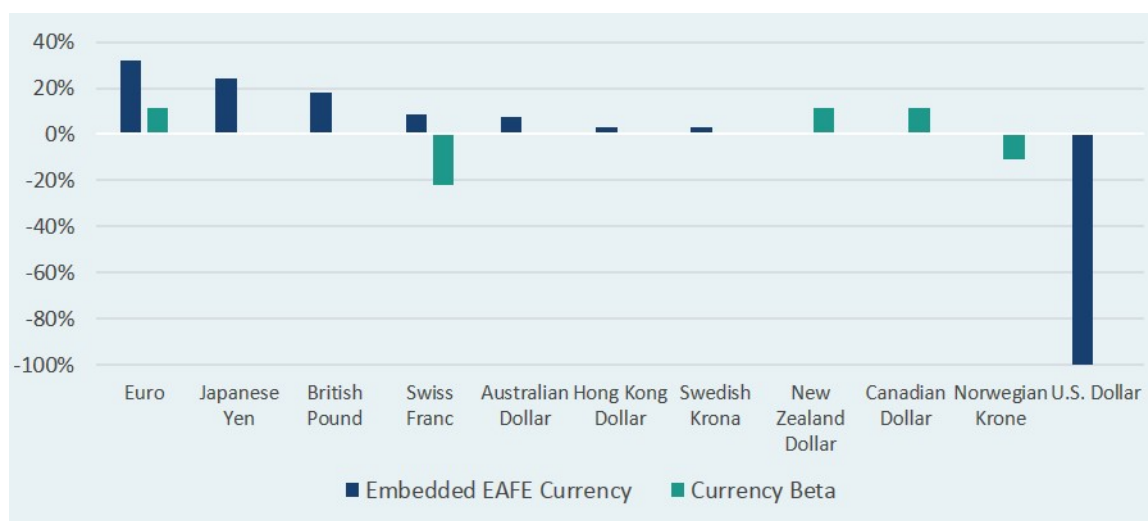
Source: Morningstar, MPI, as of 4/30/18

An important consideration in currency beta is the diversification between factors, which helps explain the relatively modest volatility. Correlations between the factors have been zero or slightly negative. For example, during the financial crisis, the risk-off environment caused many carry trades to unwind as flows moved into lower yielding safe haven currencies. The carry factor suffered a drawdown loss of almost 30% from July 2007 to January 2009, but momentum performed well during this period, resulting in a relatively small loss for the overall currency beta portfolio of 2.7%.

Using currency beta in portfolios

Currency beta can be used as a tool to help manage embedded currency exposures in portfolios. For investors who want to retain some form of currency risk, one possible solution is to hedge the embedded currency and invest in currency beta – a strategy known as currency beta replacement. Compared to a fixed hedge, the goal of currency beta replacement is to alter the currency exposure, rather than remove it. This strategy effectively changes the currency exposure in a portfolio from an uncompensated risk (embedded currency) to one that has historically received a risk premium (currency beta). Exhibit C provides an example of just how significant the change in exposures may be. In a currency beta replacement strategy, the embedded currency (blue bars) will be hedged away and an investor will be left with the currency beta exposures (green bars).

EXHIBIT C – CURRENCY EXPOSURES

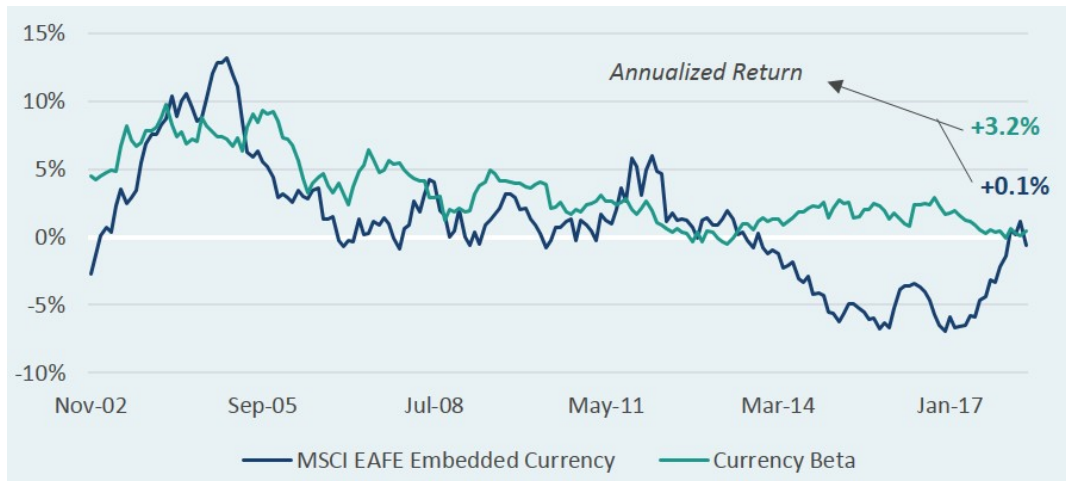


Source: MSCI, Russell, as of 9/30/17

Relative to the embedded currency in MSCI EAFE, currency beta has provided higher returns with lower risk. Since 2000, currency beta has experienced an annualized return of 3.2%, versus 0.1% for the embedded currency, and at a fraction of the volatility. The results have

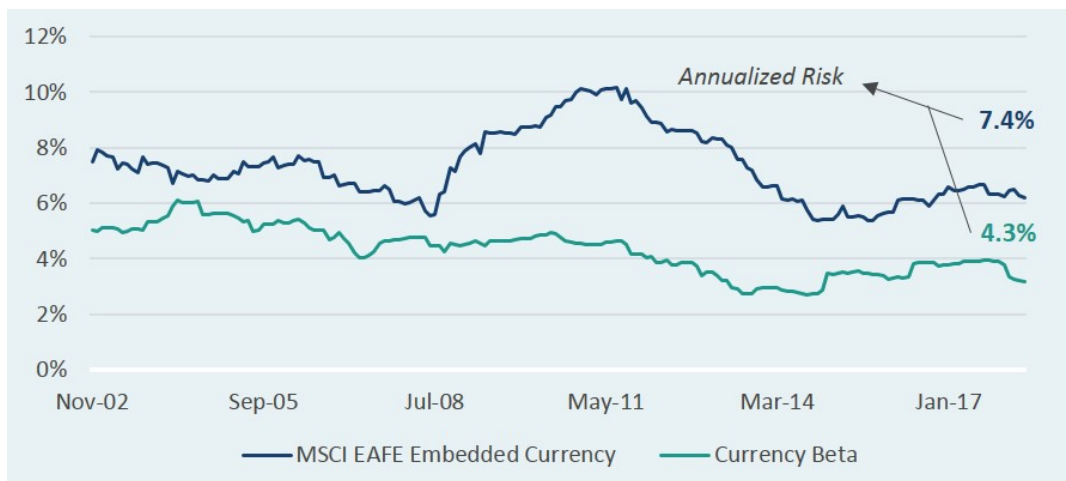
been just as impressive when comparing an unhedged international equity portfolio to one with currency beta replacement - currency beta replacement has added 1.9% per year in additional return. Exhibits D and E compare the performance and risk of the standalone currency exposures and exhibits F and G compare the unhedged MSCI EAFE Index to the hedged MSCI EAFE Index with currency beta replacement.

EXHIBIT D – 3-YEAR ROLLING RETURNS



Source: Morningstar, MPI, as of 4/30/18

EXHIBIT E – 3-YEAR ROLLING RISK



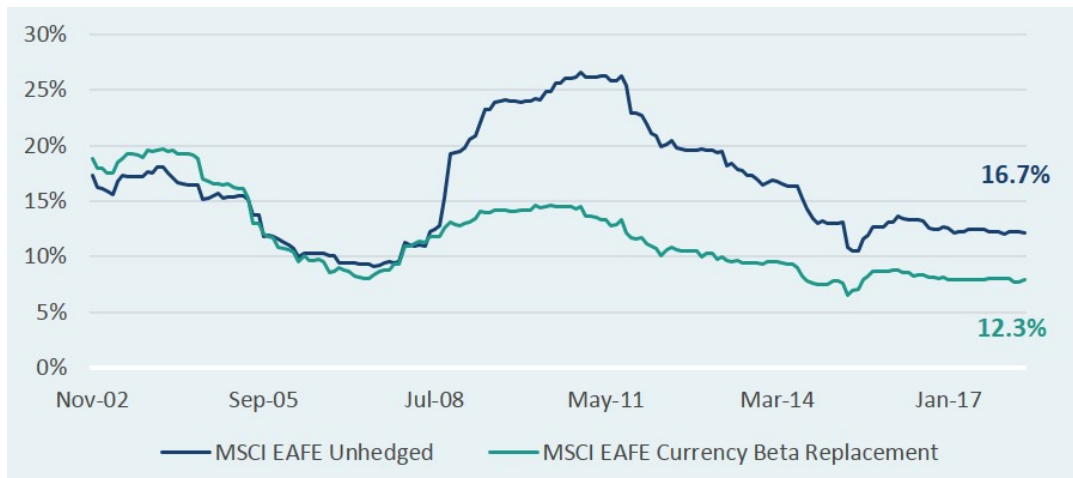
Source: Morningstar, MPI, as of 4/30/18

EXHIBIT F – 3-YEAR ROLLING RETURNS



Source: Morningstar, MPI, as of 4/30/18

EXHIBIT G – 3-YEAR ROLLING RISK



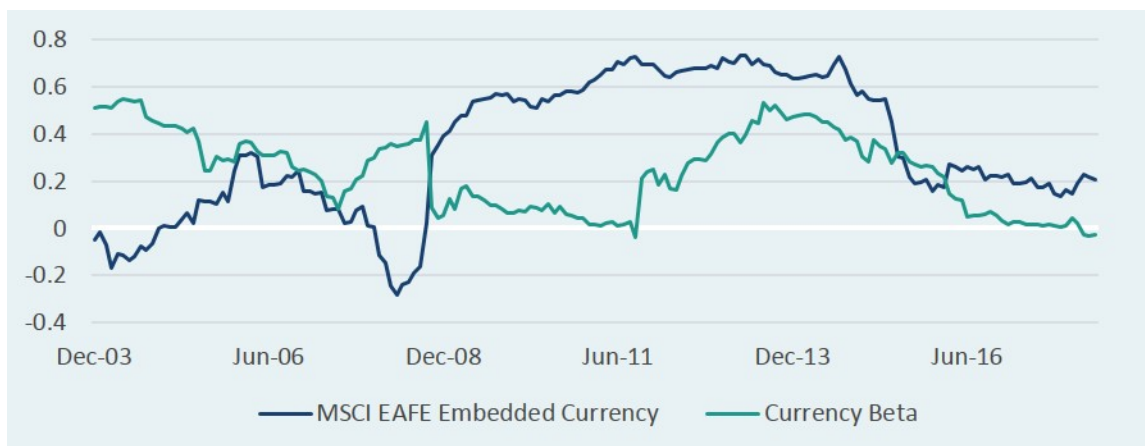
Source: Morningstar, MPI, as of 4/30/18

Currency beta has also provided more downside protection than the embedded currency exposure. On a standalone basis since 2000, currency beta experienced a max drawdown from peak of 6.1%, while the embedded currency had a max drawdown of 26.5%. Additionally, the duration of the drawdown (time to go from peak to trough) was only two years for currency beta, compared to five years for the embedded currency. This is not surprising given the embedded currency is 100% short the U.S. dollar, which has experienced long cycles of depreciation and appreciation. Currency beta on the other hand, is much more diversified across currency pairs and factors.

Currency beta and diversification

The diversification benefit that currency has provided at the total portfolio level is also an important consideration. Some industry professionals will argue that one of the main reasons to ignore the embedded currency exposure in a portfolio is because it provides enough diversification to justify its standalone volatility. Two counterpoints are important to address with this argument: 1) although the embedded currency has exhibited low and even negative correlations with many asset classes, it has historically added volatility to a typical 60/40 global portfolio⁸, and 2) during times of financial stress, correlations between the embedded currency and other asset classes have increased, exactly when the diversification is needed the most. Part of this second point can be explained by the embedded currency portfolio's concentrated short position in the U.S. dollar, which has seen heavy inflows during global equity market drawdowns. As the dollar strengthened during these times, foreign currencies depreciated while equities declined, leading to an increase in correlations. Replacing the embedded currency with currency beta may provide greater diversification at the total portfolio level. Although the correlations to a global 60/40 portfolio have fluctuated over time, currency beta has experienced a slightly lower correlation (0.2) compared to the embedded currency (0.3) over the long-term. Exhibit H shows the rolling 3-year correlations between the embedded currency in an MSCI EAFE portfolio and currency beta with a 60/40 global portfolio.

EXHIBIT H – 3-YEAR CORRELATIONS WITH A 60/40 GLOBAL PORTFOLIO



Source: Morningstar, MPI, 1/31/01-4/30/18

Important considerations

There are several key factors to consider before implementing a currency management program in addition to the investment implications. First and foremost, U.S. institutional investors will need to be aware of peer risk because the most common approach to currency

is to do nothing. In periods with large currency movements, the experience of portfolios that manage currency risk may be quite different than the experience of most peers.

The use of derivatives (currency forward contracts) presents unique considerations that may be new to many investors. Forward contracts not only add complexity to portfolios, they also create liquidity risk. Currency strategies are typically implemented with short-term (1-3 month) currency forward contracts. As the forward contracts approach expiration, they must be closed out and a new contract must be opened in order to maintain the proper exposures – a process known as “rolling the contracts”. When the expiring contracts are closed out, it locks in a gain or loss that will be paid or received as a cash flow on the expiration date. While cash flows tend to be a small percentage of the total exposure, investors will need to properly manage this risk.

The key takeaway is that managing currency introduces risks that should be an important part of the decision-making process. The impact of these risks will be unique to each investor. The appropriate currency solution will not only depend on the investment goals, but also peer groups, liquidity profile, ability to use derivatives, and overall enterprise risk tolerance.

Conclusion

The embedded currency exposure in a typical international portfolio is not representative of the currency market as a whole, and is an uncompensated risk. An investor who chooses to leave this exposure in their portfolio is making an active bet. The type and magnitude of this bet can be measured through the construction of a currency benchmark, which is known as currency beta. The currency beta benchmark gains systematic exposure to three factors that have been shown to drive core currency return behavior, and is more representative of the reality of the market. For investors who want to retain foreign currency exposure in their portfolio, a simple strategy is to hedge the embedded currencies and replace this exposure with currency beta. This strategy has been shown to produce higher returns with lower risk, especially downside risk. We believe currency beta is a reasonable benchmark for currency exposure and may be an improvement over embedded currency. Investors should carefully consider how different their foreign currency exposure is from this type of currency beta benchmark and whether they are comfortable with making this type of active bet. This decision should be weighed against the complexity and risks involved, such as liquidity and peer risk, to ensure the strategy fits within an investor’s overall enterprise risk tolerance. In our third and final paper, we will look at additional options for managing currency exposure, including active strategies, and provide a holistic framework for how we believe investors should approach currency management.

Notes & Disclosures

1. This paper will expand on topics discussed in our previous paper on currency hedging. *The Cost of Not Hedging Foreign Currency* can be downloaded here: verusinvestments.com/insights.
2. The Russell Conscious Currency Index is used as a benchmark to proxy currency beta returns in this paper.
3. Although in practice the benchmark that investors end up using by accident is simply the embedded currency portfolio from their equity market benchmark – a portfolio created from a short position in their domestic currency and a series of long positions in the weights of the public equity markets in which they hold stock.
4. Pojarliev, Momtchil, and Richard M Levich. *A New Look at Currency Investing*. 2012
5. Toner, I. (2014). Separating Currency Returns from Asset Returns in Theory and Practice: Conscious Currency and Beyond (M. Pojarliev & R Levich., Eds.). In *The Role of Currency in Institutional Portfolios* (pp. 93-117).
6. Purchasing power parity is an economic theory that exchange rates between two currencies are in equilibrium when a basket of goods is priced the same in each market.
7. Menkhoff, Lukas, et al. "Currency Momentum Strategies." *Journal of Financial Economics*, 2011
8. The global 60/40 portfolio consists of 33% MSCI U.S. Index, 21% MSCI EAFE Hedged Index, 6% MSCI Emerging Markets Index, and 40% U.S. BBgBarc Aggregate Bond Index

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