Risk Without Reward: The Case for *Strategic* FX Hedging

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We consider the case for strategic currency hedging as a tool for explicitly targeting optimal currency exposure in international equity portfolios. We show that foreign currency exposure meaningfully adds to risk in most environments, and does so without providing commensurate compensation. In periods when the correlation between international stock returns and foreign currency returns is positive, basic portfolio math means that the additional risk is particularly pronounced. A strategic program of full or partial currency hedging can therefore help reduce portfolio risk and drawdowns, while maintaining expected returns.

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I. Introduction

While the recent surge in the value of the U.S. dollar has created winners and losers among currency managers, it has proven to be a thorn in the side of another set of investors: those running unhedged international equity portfolios in the U.S. Consider an investor holding an unhedged passive market-weighted portfolio of world equities. In effect, the investor is holding two portfolios — a locally denominated market-weighted portfolio of these equities plus a basket of foreign currencies (with the weights determined by the passive equity portfolio).[1] Sharp losses in this second component of the portfolio — over $1 trillion for U.S. pension plans in unhedged portfolios between July 2014 and March 2015 according to some estimates[2] — has sparked renewed interest in the question of optimal foreign currency hedging. While hedging would clearly have been beneficial for U.S. investors in the most recent period, what is the *long term* case for strategic currency hedging?

From a risk-reward perspective, we find that while the equity component of international portfolios makes good economic sense, there is less economic justification for the implicit currency basket. Foreign currency exposure typically adds meaningful risk to international equity portfolios, without commensurate compensation. In other words, the amount of incidental currency risk found in a completely unhedged portfolio exceeds what could be justified by any reasonable excess return or correlation assumption. And the historical impact of that currency exposure has been meaningful: unhedged international equity portfolios have realized 15% more volatility than hedged, and suffered a maximum 1-year drawdown over 30% greater.[3] Yet unhedged is a prevalent choice among investors — our estimates show that of 428 international equity funds available in the U.S., totaling $1,610 billion in assets, only 20.9% include currency hedging.[4] This default approach of allowing currency allocation to simply "fall out" from an unhedged allocation, while operationally simpler, can represent an extreme and perhaps unnecessary bet.[5] Currency hedging is a useful tool for direct targeting of strategic foreign currency exposures, allowing investors to explicitly choose their optimal level of currency allocation, much like they would for other asset classes.

So how could an investor more optimally allocate currency exposures in a portfolio of international equities? One can look to Modern Portfolio Theory for the answer: weights should be chosen to maximize expected risk adjusted returns (e.g., Sharpe ratio) of the portfolio, given the key

[1] An underlying assumption is that foreign companies have assets denominated in their home currencies, such that exchange rate changes drive changes in dollar valuations, creating a currency component to international equity returns for a U.S. based investor. While a trend of globalization and cross border holdings creates a challenge to this assumption (e.g., LeGraw (2015)), unless foreign companies are purely holding U.S. assets, there is still foreign currency exposure. To that end, empirical evidence suggests that unhedged international equity returns have not seen a decrease in their foreign currency component: the beta of unhedged foreign country returns to currency returns, *increased* on average from 0.9 to 1.1, when comparing the 1995-2015 period to the 1975-1995 period, with 13 of 20 countries showing increases. This might be driven by companies hedging their foreign currency exposure, effectively denominating their assets in their home countries. A separate point to note is that the trend of internationalization could mean investors face implicit currency exposure in *domestic* equity allocations, leading to a greater correlation between domestic equity positions and unhedged equity positions.

[2] Chavez-Dreyfuss (2015), "Analysis: Strong dollar knocks off $1 trillion from U.S. pension assets" http://www.reuters.com/article/2015/07/02/us-usa-currency-pensions-analysis-idUSKCN0PC1RF20150702 (accessed August 6, 2015).

[3] While we think it is useful to consider the impact of investment decisions on historical maximum drawdowns, we recognize the difficulty in gaining statistical confidence in a metric that is, by definition, based on a single observation.

[4] Based on eVestment universe of hedged vs. unhedged EAFE managers as of 03/31/2015. Note that this data does not capture instances when investor overlay separate currency hedges.

[5] Historically, this approach might have been justified as additional trading (with associated costs and operational complexity) is required to achieve a hedged position. However, the increase in size and liquidity of currency derivative markets have made the cost trivial — the cost of hedging a developed international equity portfolio using quarterly currency forwards is estimated at under 5 basis points per year, according to AQR transaction cost estimates accounting for quarterly rolls and rebalances due to index weight changes. This estimate is based on an international portfolio size of roughly $5BN. For much larger portfolios, costs could be greater and therefore erode the benefits of currency hedging. Moreover, we feel strongly that this use of derivatives, while introducing financial leverage and additional instruments to the portfolio, is still risk reducing, as it hedges economic exposures (e.g., see Asness, Kabiller and Mendelson (2010)).

assumptions of mean, volatility and correlations of the underlying assets. For currencies to be a good addition to a portfolio, they should be expected to enhance returns per unit of risk by some combination of adding to returns or reducing portfolio risk. However, they appear to do neither for U.S. investors: foreign currencies as an asset class do not typically offer high expected returns ex ante, yet they almost always have meaningful stand-alone risk. In the context of a portfolio, we find that they would have to be *negatively correlated* to other exposures in order to reduce risk. In fact, to justify the magnitude of currency exposures found in an unhedged international equity portfolio, this correlation would have to be as low as -0.5. This has never been the case historically for a U.S. investor! Simply put, an unhedged portfolio, which provides full exposure to global currencies, exposes the investor to too much risk without enough reward.

From an academic perspective, the literature is quite clear that the optimal portfolio involves some amount of currency hedging.[6] In this paper, we evaluate optimal portfolio currency allocations for a U.S. investor from two perspectives: (i) a mean-variance optimization approach looking at how assumptions for expected returns, volatilities and correlations should impact the hedging decision, and (ii) an ex post evaluation of the historical impact of targeting different levels of currency exposures via a currency hedging program. Note that while our analysis is largely conducted from the perspective of a U.S. investor, a similar framework is applicable for any global investor. While an average global investor should see a volatility reduction from reducing currency risk, those in countries in which foreign currencies are persistently negatively correlated with equity markets — often the case in high yielding countries like Australia — would have a greater incentive to holding foreign currencies as a portfolio diversifier. Even in these cases, the optimal currency exposure may not be as much as is found in an unhedged portfolio.[7] In addition, the parsimonious approach explored here can be extended in a number of directions, including:

- Considering variable allocations by foreign currency
- Using style-based active factors to drive dynamic tilts from strategic allocations
- Incorporating other portfolio allocations (beyond just the international equity component) to evaluate risk contributions in more holistic terms.

II. A Mean-Variance Optimal Approach to Currency Allocation

To answer the question of optimal currency hedging, we start by considering whether a mean-variance optimizing (MVO) investor should have any desire for foreign currency exposure. As in the standard MVO problem, we focus on an investor attempting to maximize expected return subject to a given level of risk in their portfolio. The key inputs to this problem are the expected returns, variances and correlations of the underlying assets; all else equal, investors should prefer assets with higher expected return, lower variance and lower (or even negative) correlation. Our case study is a U.S. investor holding a hypothetical passive market-capitalization-weighted portfolio of hedged international equities and seeking to decide how much

[6] See Perold and Schulman (1988), Black (1989), Glen and Jorion (1993), Jorion (1994), Ang and Bekaert (2002), Campbell, Serfaty-de Madeiros and Viceira (2010), Schmittmann (2010), and Topaloglou, Vladimirou and Zenios (2011), among others, for papers demonstrating improved mean-variance portfolio optimization through the use of currency hedging. For an alternative view, see Froot (1993) and LeGraw (2015).

[7] Note that in cases when negative correlations are driven by a country having high yields, foreign currencies often have had a corresponding negative return — in other words, while reducing volatility, foreign currency exposures might still not be optimal from a risk adjusted return perspective.

currency exposure to optimally target in order to maximize risk adjusted returns.[8] The question therefore boils down to evaluating our key inputs (expected returns, variances and correlations) for hedged international equities and foreign currencies. As previously discussed, the implicit allocation to foreign currencies in an unhedged portfolio is meaningful; we consider each of these inputs in turn to see if they can help justify this exposure.

Expected Returns

Unlike for stocks, economic priors do not support a case for significant, unconditional excess returns to passive long positions in developed foreign currencies as an asset class. In fact, given the long-short nature of any currency trade, it would be infeasible for all currency investors globally to have meaningfully positive expected returns at all times — gains to foreign currency investors in one country should result in approximately equivalent losses to investors in another in each period.[9] That is not to say that it is impossible to generate positive returns by trading currencies; academics have described certain "styles" dictating long/short currency portfolios with positive expected returns, but these are inherently dynamic in nature.[10] That is, for investors in a given country, these styles would suggest positive expected foreign currency returns during some periods and negative during others. For example, the profitability of the currency momentum trading strategy would indicate positive expected returns to foreign currencies for U.S. investors following periods of dollar weakening, but negative expected returns following dollar rallies. While other currency styles, particularly carry, can be more persistent, they are still based on inherently dynamic inputs and can therefore have meaningful changes in their views on expected return for a given currency.[11] As such, these currency styles are more relevant for an active trading strategy capable of responding to changes in underlying inputs. Conversely, they could not be as effectively implemented via a passive *long-term strategic* currency allocation. It is therefore beyond our scope to evaluate more active strategies.

Empirical evidence is largely consistent with this strong prior of very low expected returns for passive currency exposures. Exhibit 1 graphs the cumulative excess returns on an unhedged international equity portfolio (in blue) and a hedged international equity portfolio (in red).[12] The difference between the two can be attributed to the foreign currency component of the unhedged portfolio returns (in green). As the exhibit shows, while stocks had meaningful positive returns over this period, the cumulative

[8] As a reminder, we focus here on the international equity portfolio in isolation for simplicity; a natural extension would be to run a similar exercise on the investor's overall portfolio. All analysis is conducted using weekly overlapping data between January 1975 and June 2015. Hedged equity returns are computed from country futures and cash index returns from Bloomberg and Datastream over the MSCI World ex U.S. universe, weighted by market caps. Currency returns are computed from spot and forward rates from Datastream, WMCO, MSCI and broker data sets. All returns are in excess of cash and gross of fees.

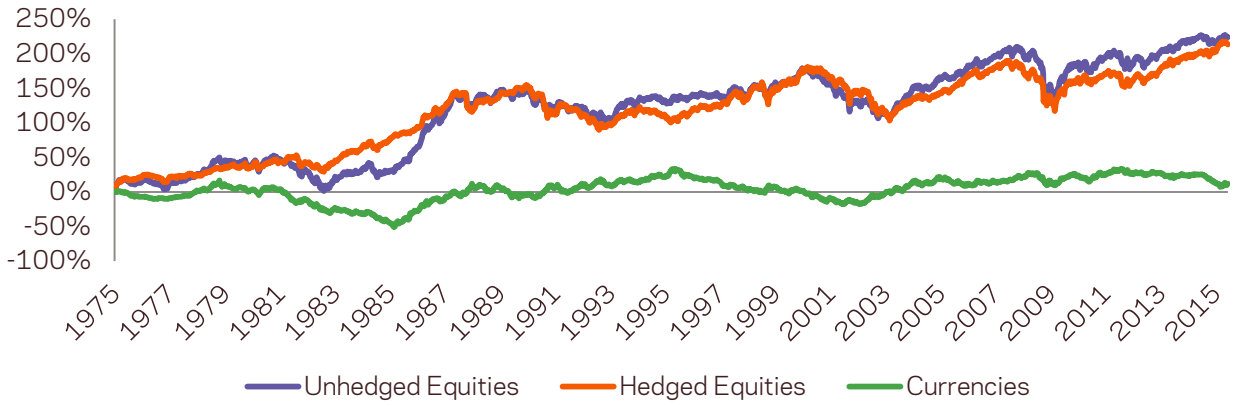
[9] Consider the trivial case of a world with just two countries, and one exchange rate linking the two. Expected foreign currency returns for investors in country A would be roughly the negation of those for investors in country B, i.e., both could not be significantly positive. If returns were very small, it would be technically feasible for both to achieve positive returns, as described by Siegel's Paradox in Black (1989), but the magnitude of returns would not be of economic interest. Black uses this fact to argue for some foreign currency exposure in investor portfolios, but he still advocates significant amounts of hedging.

[10] Examples include carry, momentum and value (e.g., described recently by Pojarliev and Levich (2007), Moskowitz, Ooi and Pedersen (2012), and Asness, Moskowitz and Pedersen (2013), among others). Moreover, Kroencke, Schindler and Schrimpf (2013) embed these types of foreign exchange strategies in the context of international asset allocation.

[11] The U.S. dollar has seen a number of shifts from being a low yielding currency to a high yielding one and back in the period from 1975-2015. Investors from certain other currencies have experienced more static carry views: the Australian dollar and Japanese yen are today considered the prototypical high- and low-yielding currencies, respectively. An Australian investor might, on average, therefore perceive negative expected returns from foreign currency exposure on average, while the opposite would be true for a Japanese investor. Interestingly, even these views would not always have been true ex ante historically. As of June 1980, Japan had one of the highest short term interest rates among developed countries, while in August 1992 Australia had one of the lowest interest rates.

[12] This "hedged equity" return is similar to, but not identical to, local currency returns on equities. In practice, foreign currency risk cannot be perfectly hedged ex ante as investors in a given period do not know the exact value of their investment in the following period in foreign currency terms (it depends on returns to the asset during the period). The "error" in hedging amounts to the product of currency and stock returns, and tends to be small in size.

Exhibit 1 – Cumulative Hypothetical Excess Returns



Source: AQR. All portfolios are hypothetical, gross of fees and excess of cash.

return for currencies, including both spot exchange rate moves and interest rate differentials, was close to zero. Specifically, over the 40-year period 1975-2015, the hedged international equity portfolio had an annualized mean excess return equal to 5.3% (t-statistic of 2.4), while the market cap-weighted currency basket had an annualized mean equal to 0.3% (t-statistic of 0.2).

In other words, while very marginally positive, the excess returns to foreign currencies vs. the U.S. dollar have been economically and statistically insignificant. It would therefore be difficult to justify a foreign currency allocation on the basis of expected returns. We now shift our focus to the volatility side of the equation: is there a case for currency exposures from the perspective of volatility minimization? The answer to this question depends on the relative volatilities of currencies and equities, and the correlation between the two.

Volatility

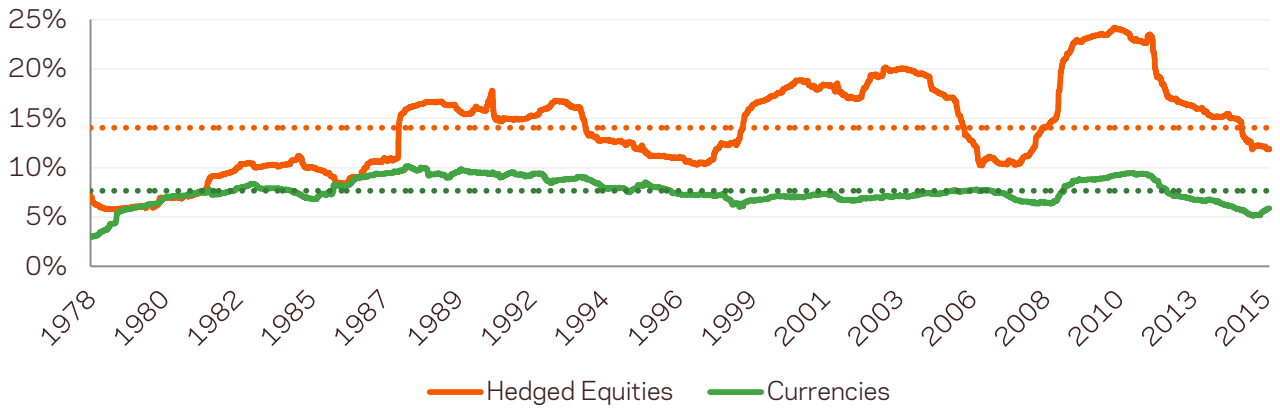
While it is well-known that equities tend to be more volatile than currencies, the volatility of currency returns is not insignificant. A reasonable rule of thumb is that, using the same portfolio weights, the volatility of a foreign currency basket is roughly half that of the corresponding hedged equity basket. Over the full time period, hedged equities experienced an annual volatility of roughly 15%, compared to 7.5% for foreign currencies. Exhibit 2 takes a more granular look at realized volatility using rolling 3-year estimates of weekly return volatility (annualized) and, for the most part, confirms this result. The non-trivial volatility of currencies is perhaps most obvious in international bond investments, where the same currency risk would be the majority of risk if left unhedged — this fact seems clearly acknowledged by investors' actions, with almost 50% using hedged international bond managers, according to eVestment data.[13]

Correlation

Given the meaningful stand-alone risk of currencies, a portfolio allocation would only be attractive to a variance minimizing investor if it had hedging properties that reduced the overall portfolio volatility. Exhibit 3 presents a stylized

[13] As of March 2015, eVestment reported a total AUM of $975 billion in hedged Global Fixed Income portfolios, vs. $1,174 billion in unhedged Global Fixed Income. Given that there is likely some overlap between international bond and international equity investors, it is surprising to see such a dichotomy in hedging behavior. If these investors were targeting optimal currency exposure at their overall portfolio level, the path of completely hedging bond exposures but not equities could only be optimal if the relative size of the equity allocation was exactly equal to their portfolio level desired foreign currency exposure.

Exhibit 2 – Rolling 3-Year Volatility



Source: AQR. All portfolios are hypothetical, gross of fees and excess of cash.

depiction of an optimal currency allocation for this investor given different levels of expected correlation between stocks and currencies, assuming a zero expected return for currencies. As the correlation becomes more positive (moving from left to right on the picture), an investor should prefer a lesser amount of currency exposure.[14] At a correlation of 0, an investor should have no desire for currency exposure; a negative correlation is required to justify any amount of currency risk as a volatility reducer. This might be surprising to some readers, but is perfectly intuitive. Adding exposures that are uncorrelated to an existing portfolio, but do not add to returns, is not economically beneficial (it is just noise!). In fact, for a notional allocation of 100% to currencies (represented by an unhedged portfolio) to be optimal, the correlation would have to be extremely negative (more negative than -0.5). Therefore, in most environments, currency allocations less than 100% are optimal, implying at least partial hedging. Cases of significant positive correlation between equities and currencies would actually be supportive of a *negative* currency allocation, achieved by a hedge ratio of greater than 100%.[15]

So what should we expect for the correlation between equities and currencies? The answer is complex. Economic theory would point to many potential drivers of this correlation, including among others the impact of currency movements on the real output of a country; the dual impact of monetary policy on both exchange rates and equity markets; the role of capital flows in determining the joint distributional properties of exchange rates and equity returns; inflation shocks affecting nominal equity returns differently than exchange rates; and the trading characteristics of some currencies, such as whether the currency is a reserve currency or a funding currency.[16]

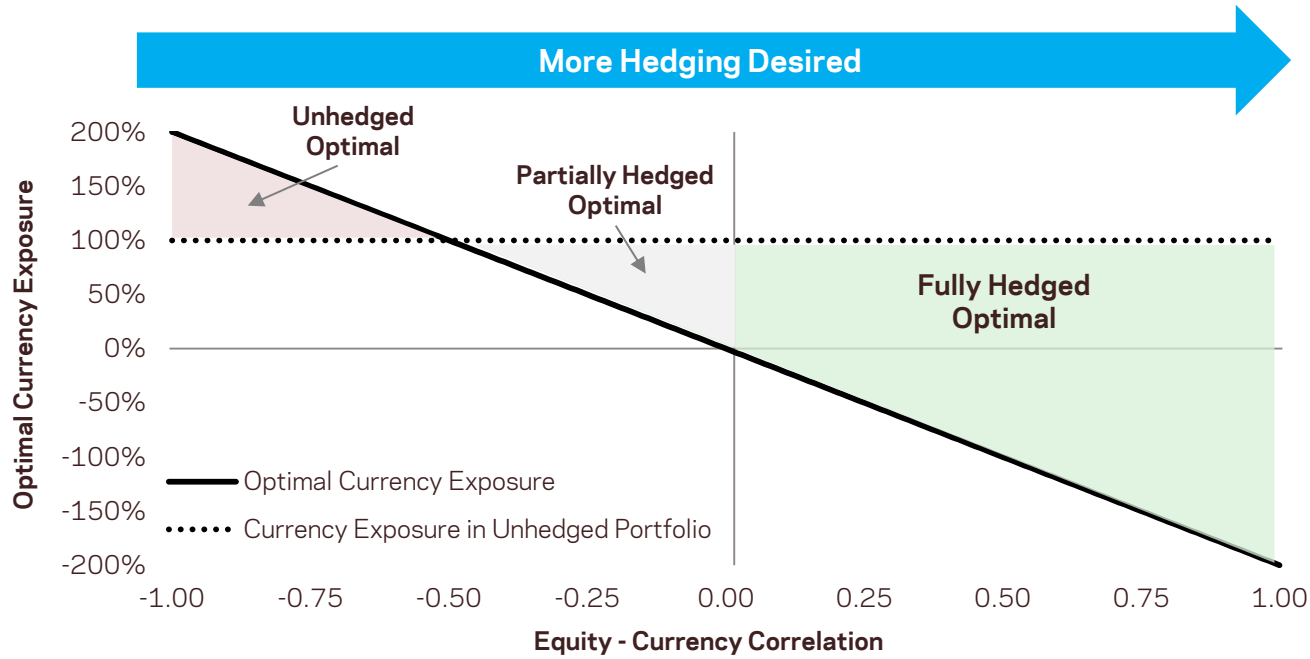
An additional complexity is that equity returns tend to reflect primarily the economic conditions in the country where the issuer does business,

[14] In order to approximately match the data, we assume the volatilities of the equity portfolio return and currency basket return are 15.0% and 7.5%, respectively. The implicit assumption of 50% relative volatility drives the slope of the depicted line. A different assumption on relative volatility would change the slope of the line. For example, an investor considering solely a portfolio of international bonds would perceive a higher relative volatility of currencies, and see a steeper line (more negative required correlation to justify a given level of currency exposure).

[15] An investor considering currency risk in the context of an overall equity portfolio (domestic and international) would see a more muted benefit to currency hedging, as relative currency risk would be a smaller component of that portfolio (contingent on the correlation of foreign currency with other components of their portfolio)

[16] For examples of each of these effects, see respectively Dornbusch and Fisher (1980), Gavin (1989), Hau and Rey (2006), Boudoukh and Richardson (1993), Katz, Lustig and Nielsen (2015) and Cenedese (2015). See Campbell, Serfaty-de Madeiros and Viceira (2010) for a discussion of currencies' trading characteristics and how these impact foreign exchange hedging and the international asset allocation decision.

Exhibit 3 – Optimal Currency Exposure with Different Levels of Correlation Between Equities and Currencies



Source: AQR. All portfolios are hypothetical. Assumes hedge ratios between 0 and 100% (foreign currency exposure between 0 and 100%) and 0 ER for foreign currencies.

while FX rates tend to reflect the relative economic conditions between two countries. Consider, for example, the potential benefit of foreign currency exposure as an inflation hedge. The argument is that in times of high inflation, investors will see foreign currencies appreciate (due to Purchasing Power Parity (PPP)), even as other parts of their portfolio, such as equities, underperform. However, the PPP argument only holds true insofar as the U.S. experiences relatively high inflation compared to other countries. If foreign countries experience similarly high inflation at the same time, as might be expected in a commodity shock for example, investors should not expect a meaningful change in the exchange rate.[17]

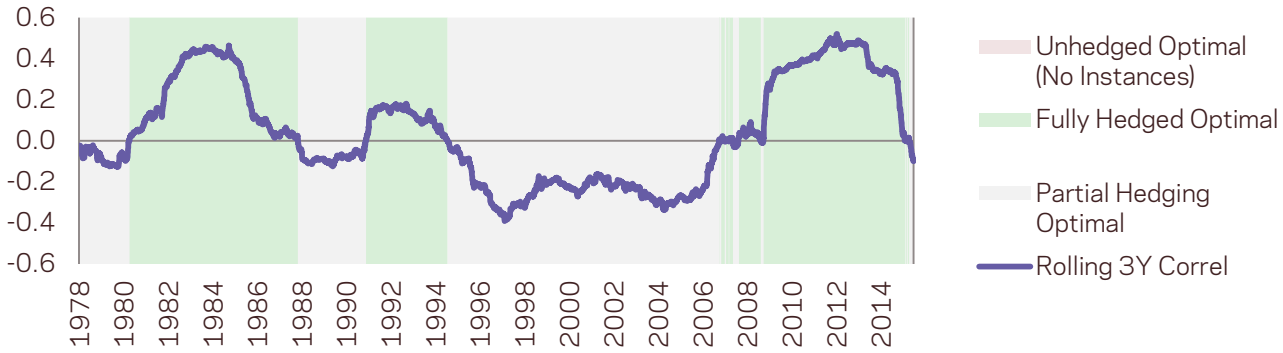
Based on this complication, as well as the additional competing effects outlined above, expectations for the correlation between the international equity portfolio and the currency basket will vary across time and across base currencies. Indeed, the evidence in the academic literature on co-movements between currencies and equities is somewhat mixed.[18] It is not nearly sufficient to support a prediction of strong negative correlation between international equities and foreign currencies for a U.S. investor; yet as previously mentioned, a correlation as low as -0.5 would be required to justify a fully unhedged position.

Exhibit 4 graphs a rolling 3-year correlation of the returns of a hedged portfolio of international equities and its corresponding basket of currencies against the dollar. Consistent with our mixed economic intuition, the correlation pattern

[17] To that end, emerging market currencies may be more effective inflation hedges for U.S. investors than developed currencies, given that their inflation cycles are expected to be less correlated to that of the U.S. More broadly, investors might better address inflation sensitivity at the portfolio level by an explicit allocation to real return strategies, rather than relying on incidental developed currency exposure from international portfolios.

[18] See, for example, Roll (1992), Chow, Lee and Solt (1997), Phylaktis and Ravazzolo (2005), Cumperayot, Keijzer and Kouwenberg (2006) and Lustig, Roussanov and Verdelhan (2012).

Exhibit 4 – Rolling 3-Year Correlation of Hedged Equity Exposure and Foreign Currency Exposure



Source: AQR. Assumes hedge ratios between 0 and 100% (foreign currency exposure between 0 and 100%) and 0 ER for foreign currencies.

shows big swings over the last 40 years, though the correlation has a full sample average of 0.04. Furthermore, there was not a single period in which the correlation was negative enough to make a fully unhedged portfolio optimal according to the assumptions laid out above. While in all periods, a smaller currency allocation would have had a lower volatility, hedging would of course have had the most impact in periods when the correlation was meaningfully positive. [19]

In summary, the MVO framework outlined at the start of this section allows investors to evaluate if strategic foreign currency allocations should be expected to improve the risk adjusted returns of their portfolio. In order to justify the significant currency allocation found in an unhedged international equity allocation, one would have to assume either meaningful positive returns to foreign currencies, or hedging properties that would reduce risk in a portfolio context. We didn't find either of these in the historic sample; our conclusion is that we would expect some amount of currency hedging to have been beneficial to an investor looking to maximize risk adjusted returns.

III. Historical Implications of Currency Allocation Level

To test this prediction, we more directly evaluated the historical impact of currency hedging on realized returns of an international equity portfolio. Specifically, we consider a portfolio with a 100% currency allocation (unhedged) along with those with 75%, 50%, 25%, 0% and -25% allocations.[20] The 0% portfolio is fully hedged, while the -25% contains short positions in currencies.

The results of Table 1 demonstrate that, over the last 40 years, currency exposures were detrimental to risk-adjusted returns of U.S. investors. Portfolios targeting less than 100%

[19] Some non-U.S. investors might find more of a case based on correlations. In a study of G7 countries, we found that while the U.S. has time varying correlations with an average of close to 0, certain countries tend to have positive correlations on average, while others tend to have negative. Negative correlations were typically associated with high yielders or commodity exporting countries. While there was just 1 country for which the long term correlation was negative enough to warrant a preference for unhedged equities for a volatility minimizing investor, several countries experienced sub-samples during which foreign currency exposures reduced volatility. Nonetheless, unless these sub-samples are predictable ex ante, investors in these countries might still benefit from hedging on a strategic basis.

[20] For simplicity, we assume a constant hedge ratio across all currencies — a more sophisticated approach could include variable hedge ratios by currencies, accounting for varying correlation patterns. A simple result documented in the literature, for example, is that higher yielding currencies have typically had higher correlations to equity markets — hedging these currencies might result in the most meaningful reduction in volatility (though this volatility reduction might come at the cost of negative returns, given that high yielding currencies tend to earn positive excess returns over lower yielding currencies over the long term). Accounting for carry differentials (or any other dynamic variable) would constitute a dynamic hedging strategy. We focus here on the truly passive strategy.

Table 1 – International Equity Portfolios With Different Target Currency Exposure (1975-2015)

	Excess Currencies	-25% Over Hedging	0% (Fully Hedged)	25%	50%	75%	100% (Unhedged)
				Partial Hedging			
Average Excess Return	0.3%	5.3%	5.3%	5.4%	5.5%	5.5%	5.6%
Standard Deviation	7.6%	14.6%	14.5%	14.7%	15.2%	15.8%	16.7%
Sharpe	0.04	0.36	0.37	0.37	0.36	0.35	0.33
Max 1Y Drawdown	-23.0%	-56.6%	-60.4%	-64.5%	-68.6%	-72.8%	-78.7%
Max Drawdown from Peak	-66.9%	-78.6%	-77.5%	-76.5%	-76.8%	-79.4%	-83.8%

Source: AQR. All portfolios are hypothetical, gross of fees and excess of cash.

currency exposure have realized meaningfully less volatility, lower drawdowns and a higher Sharpe ratio. In fact, to minimize realized volatility over this period, an optimal currency allocation would have been roughly -10%, i.e., a short position in currencies. Focusing on a comparison between a zero-currency exposure (hedged) portfolio and full-currency exposure (unhedged) portfolio, we see a volatility reduction of almost 15%, driving an almost commensurate Sharpe ratio increase (the volatility offset was slightly offset by a reduction in returns from hedging over this period)[21]. The impact on drawdowns is even more dramatic: over 1/5 of the worst 1-year drawdown of -78.7% for unhedged equities could have been avoided by currency hedging.[22] While we recognize that volatility and drawdowns are not the only measures of risk, we think they do capture relevant dimensions that investors should (and do) care about.[23]

One natural question is whether this volatility reduction was consistent, or concentrated in a specific sub-period. Exhibit 5 shows the ratio of rolling 3-year realized volatilities of the zero-currency exposure vs. full-currency exposure portfolio. We see that the volatility reduction occurred in most sub-samples, with decreases exceeding 30% at times. Moreover, in no environment did the zero-currency exposure portfolio have volatility exceeding that of the full-currency exposure portfolio by more than 5%. In other words, currency exposure rarely provided meaningful hedging benefits.

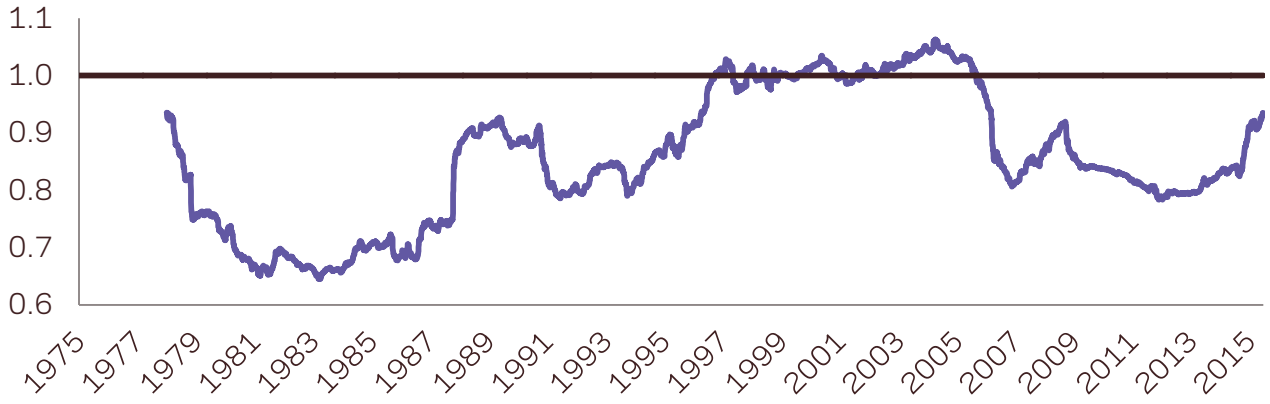
Overall, directly analyzing the historical impact of currency hedging led to results consistent with priors from our mean-variance optimization framework: the high standalone risk of currencies means that it is difficult to find an economic environment in which full-currency exposure is risk reducing. A decision to allocate full-currency exposure via an unhedged international equity portfolio represents an overly concentrated bet on this historically rare type of environment.

Nevertheless, it is important to acknowledge that while currency hedging would have helped U.S. investors historically, conditions could change to affect this conclusion. As highlighted in our earlier MVO framework, for currency exposures to be helpful to U.S. investor international equity portfolios, they would have to become significantly negatively correlated to the equities themselves. While this was not the case in our data sample, and we do not expect it be the case going forward, there are clearly states of the world in which it could be. Consider two examples:

First, increasing globalization trends in company cash flows could be sufficient to reduce the extent to which foreign equity investments embed currency risk. (As previously mentioned, there has been no empirical evidence thus far that globalization has reduced the currency

[21] As previously noted, we do not see a strong economic driver of this small, positive return — it is likely just noise
[22] See our previous footnote on the limited confidence one can have on an empirical result on a (by definition) single observation
[23] For a perspective on this issue, see Asness (2014).

Exhibit 5 – Rolling 3-Year Volatility Ratio of Hedged Equities vs. Unhedged Equities



Source: AQR.

component of foreign equity returns). At an extreme, if all companies are entirely global (and do not hedge), their local currency equity returns could become very negatively correlated to their currency returns — in this world, if their exchange rate appreciated, the value of their foreign assets and cash flows would decrease in units of their home currency. There would therefore be meaningful hedging benefits to foreign currency allocation.[24]

Second, we could see an increased prevalence or magnitude of the types of economic shocks that tend to move equities and currencies in opposite directions (the opposing reactions of the Swiss franc and Swiss Market Index following the recent Swiss National Bank decision to abandon their exchange rate floor is a good example). The historical near-zero (mild positive) correlation between foreign hedged equities and currencies indicate a balance between this type of shock and those that tend to drive equities and currencies in the same direction, but of course this could change in the future.

Yet, most economic decisions come with some uncertainty and therefore the possibility of being wrong in hindsight. Our preferred approach is to do what makes most sense from a strategic perspective considering long term empirical evidence and the economic intuition that underpins it - in this case, reduce currency exposures via strategic hedging.

IV. Conclusion

The analysis presented in this paper considers a straightforward case of a U.S. investor holding an international equity portfolio and attempting to directly target currency exposures in an optimal way. The results show that:

1) In the long term, foreign developed currencies have earned a very low level of return, consistent with economic intuition.
2) The standalone risk of foreign currencies is not trivial, and typically about half that of domestic equities.
3) The correlation between foreign currencies and domestic equity returns varies over time, but was slightly positive on average and rarely significantly negative.

Therefore, a volatility minimizing, or mean-variance optimizing investor would not favor an

[24] It is probably worth mentioning that in this extreme example, U.S. stock returns would become negatively correlated to the dollar, thereby implicitly giving investors foreign currency exposure in their domestic stock allocations.

unhedged portfolio. While some amounts of currency risk can provide diversification benefits during certain time periods, the amount found in an unhedged portfolio may be too great, if historical conditions persist. A more optimal allocation, achieved via a currency hedging program, should allow investors to achieve a more desirable risk profile without a meaningful sacrifice in terms of expected returns.

As a final comment, note that the analysis and conclusions presented in this paper result from several simplifying assumptions including a zero expected return for foreign currencies, a constant hedge ratio across all foreign currencies and the choice of a single hedge ratio to use in all time periods. Shorter term views on conditional returns or correlations, motivated by economic environments (e.g., inflation and economic growth) or styles (e.g., currency carry) and customized to each individual foreign currency, can be used to further improve return and risk characteristics. Nonetheless, their time varying nature mean that they are best left to dynamic hedging programs, with the agility and flexibility to effectively take advantage of this information, and implemented with a risk allocation appropriate to their expected efficacy. Additionally, an investor would be well advised to consider decisions of optimal currency targeting at an overall portfolio level which can incorporate implicit currency exposure from all international allocations, and additional information from correlations of currencies to all component asset classes.

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